

ADVANCED NETWORKS

Sprint plans 'sweeping' network revisions

BY DANIEL BRIERE

Sprint has begun quietly rearchitecting its network in hopes of leapfrogging the switched data services and high-end voice offerings of rivals AT&T and MCI Communications Corp.

At the Telecommunications Association '93 conference in San Diego this week, Sprint is expected to detail Project Diamond, under which it has created a switched data subnetwork to improve current data services and pave the way for advanced data network offerings.

In a separate architectural effort that Sprint outlined for *Network World* — dubbed Project Darwin — the company said it will trial later this year a new Intelligent Network (IN) platform to support its high-end Virtual Private

Network (VPN) service. The IN system will also lead to the enhancement of Sprint's 800 and calling card offerings beginning next year.

"The last time we did such an overhaul was in 1988 when we deployed Signaling System 7," said Steve Pearce, vice president of technology planning.

The changes will indeed be sweeping, affecting all of Sprint's high-end customers and many mid-range users.

"Customers will have a more flexible and customizable network," Pearce said. "The move to an enhanced IN platform for these services represents just Step One of a network evolution whose end goal is for Sprint to become the first carrier to launch an all-[Synchronous Optical Network], broad-

See Sprint, page 10

IBM reveals details of controller line overhaul

BY MICHAEL COONEY

Raleigh, N.C.

IBM this week will roll out the first in a series of enhancements intended to increase the capacity, performance and interoperability of its three main controller products.

In a wide-ranging interview here, IBM executives spelled out enhancements that will effectively double the capacity of its 3745 Communication Controller, improve its efficiency and add TCP/IP routing support. IBM is also planning a more powerful, Asynchronous Transfer Mode (ATM)-compatible version of its 3172 Interconnect Controller and will give its 3174 Establishment Controller support for higher speed wide-area links, including frame relay.

"The overriding strategy with our controller lines is to help users migrate to the networking world of

tomorrow with features like multi-protocol and ATM support, without requiring forklift upgrades to get there," said Antoine Granatino, director of network processor systems in IBM's Networking Systems line of business. "We will also continue to add more powerful features to help existing SNA users."

Within the next six months, IBM will announce a new 3745 line scanner that more than doubles the number of lines that can be attached to a single front-end processor.

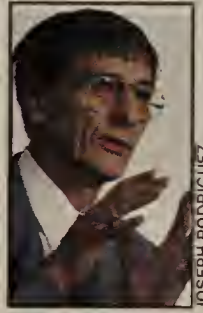
The scanner will be capable of handling four T-1 lines, plus 32 256K and 96 64K bit/sec Synchronous Data Link Control lines. Existing 3745 scanners, which are the devices that control transmission lines, support less than half those numbers.

The new scanner will work with the 3746 Model 900, which is a chassis that bolts onto existing 3745 Models 210, 310, 410 and 610 to expand their capacity.

One of the benefits of the 3746 is that it off-loads communications processing from the main 3745 CPU, saving expensive, performance-sapping Network Control Program (NCP) cycles. NCP is the 3745's operating system.

"With the new scanner handling all of the SDLC processing, users can expect to see a 50% savings in NCP cycles," said Jean Lorrain, a senior member of IBM's technical staff. "Users will be able to concentrate a large number of lines, with higher throughput, in a smaller space."

See Controllers, page 67



LORRAIN

JOSEPH RODRIGUEZ

Employers tighten the purse strings

BY JOANNE CUMMINGS

With employee reviews on the horizon, network managers are planning to boost staff salaries an average of just 4% next year, according to *Network World's* Annual Salary Survey.

The survey findings suggest that employers will play from a stacked deck in doling out salary compensation at a time when many employees are reluctant to hop jobs. The survey found just 6% of respondents changed companies within the past year, an indication that most network staffers prefer to cling to the security of a position even if it pays less than they think it should.

"I've placed more people at lateral or reduced salary levels in the past year than I have in the previous four years," says Frank Schoff, president of Management Recruiters, a search and recruiting specialist based in Cedar

Mountain, N.C.

One reason, according to the survey findings, is most companies can hire new networking professionals at substantially lower salary levels than

\$ALARY Continued on page 50

U R V E Y

Cheaper to replace?

On average, companies are paying new hires about 11% less than the networking professionals they replaced.

Position	Salary	New hire salary
Upper management	\$83,910	\$72,251
Senior LAN	\$52,590	\$47,314
Senior engineering	\$59,477	\$53,273
Senior operations	\$48,869	\$43,786
Senior net applications development	\$53,701	\$47,314

SOURCE: NETWORK WORLD
GRAPHIC BY SUSAN SLATER

HEALTH CARE REFORM

Network cure may be costly for health care firms

BY BOB BROWN
AND ELLEN MESSMER

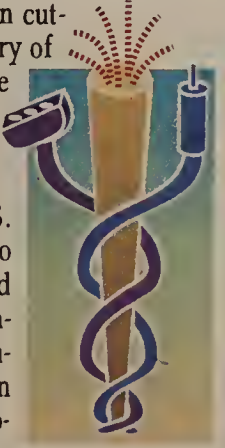
Washington, D.C.

The Clinton administration's long-awaited health plan being unveiled this week is expected to endorse networking as a key component in cutting costs and streamlining delivery of services. But users and others in the health care industry say major changes will be needed to realize the promise of technology.

Among other things, the U.S. health care blueprint is expected to call for the creation of standard electronic patient records, containing medical and insurance information, that could ease information exchange among health care providers and insurers. It will also encourage use of network technologies such as electronic data interchange to link providers, insurers and the government in order to shave the time and cost of claims processing.

While the wisdom of the Clinton plan will be

See Health care, page 67



Group pitches certification plan for network pros

BY WAYNE ECKERSON

Denver

A group of network professionals last week launched a nonprofit corporation that will establish a nationwide testing and certification program designed to make it easier for employers to assess the skills of network staffers.

The National Association of Communication Systems Engineers (NACSE), based here, will certify engineers in four categories based on their knowledge and expertise across a range of network technologies.

"The network profession has been getting a bad name because it's easy for people to claim to have more skills than they really possess," said Bob Kile, president of Kile & Associates, Inc. and an NACSE founder. "NACSE certification will give employers concrete criteria upon which to judge networking candidates."

For each of NACSE's certification levels, technicians will have to submit a written thesis and pass a test to demonstrate knowledge of certain network technologies. NACSE will also require the candidates to have passed the test for the previous certification level before moving on.

■ The Technical Systems Engineer (TSE) must demonstrate knowledge of network cabling, electric-

See Certification, page 66

Briefs

Time Warner, US West cement partnership. Time Warner, Inc. and US West, Inc. last week closed a deal for the local exchange carrier to buy one quarter of Time Warner Entertainment. Time Warner retains 63% of the subsidiary, which includes Warner Bros., Inc., Home Box Office and Time Warner Cable. The two companies plan to invest \$5 billion to provide interactive television service to most of Time Warner Cable's 7.1 million customers by the end of 1998. The pair's pilot system in Orlando, Fla., goes on-line in April.

Bell Atlantic to widen frame relay reach. Bell Atlantic Corp. is widening its frame relay coverage, planning to offer the service in most mid-Atlantic metropolitan areas by early this fall. The service is already tariffed in Maryland, Pennsylvania and Virginia, and Bell Atlantic is working on tariffing the service in Delaware, the District of Columbia and New Jersey. For areas where tariffs are not in place, Bell Atlantic is providing service to companies by contract.

AT&T not ready to make a commitment. In response to Rep. Edward Markey's (D-Mass.) letter asking AT&T to commit to not bundle cellular equipment with cellular services after the merger with McCaw Communications, Inc., AT&T last week stated it will follow the industry practice of offering both packaged and unbundled products. AT&T said it has no specific plans to offer packaged deals, but added that the market is competitive and it would be in the public interest to package them, as Allnet Communication Services, Inc. and MCI Communications Corp. do now.

Apple pulls the emergency lever on PCS. Last week, Apple Computer, Inc., in a last-ditch attempt to get the Federal Communications Commission's attention on the personal communications services (PCS) decision it will make this Thursday, filed an emergency petition. Apple said that if the FCC allocates 20 MHz of radio spectrum for unlicensed PCS devices as planned, 17.5 MHz should be for use by unlicensed data devices and the remaining 2.5 MHz for "nomadic" voice devices, such as mobile phones. Apple, among others, has argued that at least 40 MHz is needed to accommodate new voice and data applications in unlicensed PCSs.

Teaming up. Wellfleet Communications, Inc. and Banyan Systems, Inc. have announced an agreement under which they will provide mutual customers with technical support via the phone or electronic mail. The companies will also train each other's support personnel and share documentation and information about product releases to ensure interoperability between Wellfleet routers and Banyan network services.

Shiva gets twice-departed Lotus exec. Shiva Corp. last week announced the appointment of Frank Ingari as president and chief executive officer. Ingari was vice president of marketing for Lotus Development Corp., where he led the marketing efforts of Lotus Notes and cc:Mail. That was Ingari's second job at Lotus. He left an earlier job as vice president of Lotus's spreadsheet division to become chairman and CEO of object-oriented database software supplier Ontos, Inc.

HP to open up E-mail system. Hewlett-Packard Co. this week will announce a new version of its minicomputer-based electronic mail system that will support direct connections to Microsoft Corp. Microsoft Mail and Lotus Development Corp. cc:Mail E-mail clients. HP Open DeskManager, which runs on the HP 3000 computer, is an upgrade to the existing HP DeskManager E-mail system. The software will ship in volume later this year and is priced from \$6,000 to \$70,000, depending on system size.

Contacts

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Network **HELP** desk

Network World tracks down answers to your questions regarding products, services, technologies or disputes with vendors. Please submit questions to Susan Collins at (800) 622-1108, via fax at (508) 820-3467 or via the Internet at scolins@world.std.com.

I am having difficulty installing software on a Novell, Inc. NetWare 3.11 network server using a DOS 6.0 shell. While installing large programs such as Lotus 1-2-3 Version 4.0 and LAN Deskmanager in the Windows environment, the network node hangs when writing and reading files. Any suggestions?

Miguel Blanco, Pompano, Fla.

Ronald Nutter, escalation manager of 900 Support, an around-the-clock Novell technical support company in Lake Oswego, Ore., replies:

When upgrading to DOS 6.0 and NETX 3.32 (the network shell that is compatible with DOS 6.0), it is a good idea to update your version of IPX.COM — the program that initializes the network card at the workstation — as well.

Be sure that when NETX runs, it is reporting

the version of DOS as 6.0.

If NETX is reporting DOS 5.0, type the command SETVER NETX.EXE/D at the DOS prompt, press the enter key and reboot the workstation. This will allow NETX to properly report the DOS version of 6.0.

Once you've upgraded NETX.EXE to Version 3.32, make sure you delete the NETX.COM file to prevent it from executing instead of NETX.EXE.

Also, since you seem to be having problems just installing the programs, check your workstation and unload all possible terminate-and-stay resident (TSR) programs not required to connect to the network.

It might also be worthwhile to get the latest Internetwork Packet Exchange (IPX) drivers for your card — upgrading to the latest IPX version may not be enough.

You might even want to look into trying the DOS Open Datalink Interface method, which is the preferred way to connect a workstation to a Novell server. ODI drivers have been developed for DOS Versions 5.0 and later, and provide more benefits than IPX.COM drivers such as multiple protocols support.

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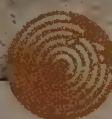
64 Networking Careers



Your networking system hasn't lived until it has a multiprotocol router. It's something that Cisco should know a thing or two about. After all, they invented it. And by consistently emphasizing the importance of listening to customers, Cisco has captured the worldwide market, owning over 50% of the router market.



To those in the know, the mere mention of the name Novell strikes up images of successful networking. Their alliance with over 2,500 software, hardware and system vendors has helped them create NetWare, the operating software that allows systems as different as Microsoft, IBM, and Oracle to work together, seamlessly. In short, Novell is the industry standard in networking software. And that standard is our standard.



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SynOptics

When you think of an intelligent wiring hub system, there's really one word that should come to mind: SynOptics. Not only are they the leader in market share, but their product development is unsurpassed, laying the groundwork not just for easy migration of applications today but to accommodate growth and future data strategies.

Clinton administration maps out national network agenda

BY BILL BURCH

Washington, D.C.

The Clinton administration last week said it would spur development of the national data network super-highway by coordinating government network efforts and funding pilot net projects at \$1 billion to \$2 billion per year.

Unveiling the administration's National Information Infrastructure (NII) agenda, Vice President Al Gore announced the establishment of an executive branch network task force and said the administration would be forming a companion public advisory council by October.

Gore proclaimed the NII critical to the nation's economy and one of the administration's top priorities. Among other benefits, an expanded network infrastructure will help lower health care costs and let government be more responsive, he added.

In announcing its NII plans, the administration kept up with past plans to rely on the private sector for most of the network investment. The plan calls for the government to fund research and pilot projects, but only to encourage business in the development of a national net. The administration's new spending plans are close to the \$1.2 billion it now invests in research and development for information technology.

Within the White House, the administration has set up a three-member task force to oversee the growth of the nation's information infrastructure. Larry Irving, head of the National Telecommunications and Information Administration (NTIA), will chair a telecommunications policy committee charged with formulating a consistent administration position on key telecommunications issues.

Arati Prabhakar, director of the National Institute of Standards and Technology, will head an applications committee that will coordinate test bed projects. Sally Katzen, head of the Office of Information and Regulatory Affairs at the Office of Management and Budget, will lead a committee with working groups on privacy, government information and intellectual property rights.

The administration is also setting up a public panel of no more than 25 members to advise on the planned NII efforts. NTIA's Irving is currently putting together a list of candidates from which Commerce Secretary Ron Brown can choose.

Keeping pace with the administration's NII plans last week was a separate announcement of the creation of a high-speed network test bed put together by a broad alliance of businesses and research organizations.

The NII Testbed group will form a series of open alliances to test applications on high-speed wide-area nets. Industry members taking part include AT&T, Digital Equipment Corp., Hewlett-Packard Co., Novell, Inc., Sprint Corp., Sun Microsystems Computer Corp. and SynOptics Communications, Inc.

The group's first demonstration project will be an Earth Data System network. Scheduled for launch in November, the multimedia application will give researchers access to environmental data, analysis software and computational resources.



GORE

AP WIDE WORLD PHOTOS

Research organizations taking part in the project include the College of Ocean and Atmospheric Sciences at Oregon State University, the Department of Energy's Sandia National Laboratories, the EUV Center for Astrophysics at the University of California, Berkeley and the Institute for the Study of the Earth, Oceans and Space at the University of New Hampshire.

The network, intended to allow collaborative work on more than 20 years of environmental data, will have three data nodes holding approximately 800G bytes of images and other types of data.

The data and service nodes — nine total — will be connected using combinations of Asynchronous Transfer Mode (ATM), Fiber Distributed Data Interface, frame relay and Ethernet links to test the performance of various network technologies. Backbone transport will be over Sprint's ATM network at the Optical Carrier-3 speed of 155M bit/sec. Local access will be provided by New England Telephone, Pacific Bell and US West, Inc. □

Keys to the infrastructure

Principles and action items for the task force.

- **Promote private-sector investment.** Work with Congress to pass legislation by year end to increase market competition, particularly in cable television and local telephone service.
- **Extend universal service concept.** This would ensure that information resources are available to all at affordable prices.
- **Act as catalyst to promote technological innovation and new applications.** The administration has requested \$1 billion for High-Performance Computing and Communications program for fiscal 1994.
- **Promote seamless, interactive, user-driven operation of the NII.** By Oct. 15, NIST is to establish a panel to review the government's role in establishing requirements and standards.
- **Ensure information security and network reliability.** Task force to investigate federal privacy policies. Also, review federal policies on encryption.

- **Improve management of radio frequency spectrum.** Administration to work with Congress to streamline allocation and use of the spectrum. White House to rely on market principles in distributing spectrum.
- **Protect intellectual property rights.** A task force to investigate strengthening copyright laws.
- **Coordinate government efforts and cooperate with other nations.** Task force to meet with state officials to coordinate NII development. Administration to seek to open up overseas markets, eliminating incompatible standards.
- **Provide access to government information and improve government procurement.** Promote interagency coordination through E-mail, reform government procurement of high-tech equipment and upgrade network infrastructure for delivery of government information.

Microsoft enhances client/server fortunes

New SQL Server a powerful competitor.

BY WAYNE ECKERSON

Boston

With all the hullabaloo about whether Microsoft Corp.'s Windows NT will emerge as the dominant operating system in the 1990s, some have lost sight of the fact that NT's success depends on the quality and usefulness of the applications it supports.

In SQL Server for Windows NT, which Microsoft began shipping last week, Microsoft has delivered a powerful database application for its new operating system that solves many of

ANALYSIS

the pressing problems besetting client/server implementations, users and analysts said.

The product provides tight integration with Windows clients and runs on a high-performance platform that can be easily scaled to meet expanding business processing requirements. It also offers a suite of distributed management, administration and security features that approach mainframe-level caliber and make it easy for users to install and maintain geographically dispersed SQL Server databases.

"SQL Server will drive sales of Windows NT. It is a very good product that will give the Unix community fits," said Rich Finkelstein, president of Performance Computing, Inc. in Chicago.

SQL Server for NT, jointly developed by Microsoft and Sybase, Inc., supports Sybase's DB-Library application program interface for DOS, Windows, OS/2 and NT clients. That will let users port client/server applications from other SQL Server platforms to SQL Server for Windows NT.

In contrast, users that implement a client/server database on a Unix platform must install Transmission Control Protocol/Internet Protocol on every client node and contend with the inherent differences between the Unix and Windows architectures, claimed Gary Voth, senior product manager at Microsoft. The SQL Server database also plugs right into most networks, since it has embedded support for TCP/IP, Inter-network Packet Exchange/Sequenced Packet Exchange (IPX/SPX), Named Pipes and WinSockets.

"The integration between SQL Server and the Microsoft desktop applications we use gives me added value for my investment," said Robert Ostermann, director of information services at Air France N.A. in New York.

Most users and analysts were impressed with SQL Server for NT's performance, which is boosted by its ability to exploit Windows NT's symmetric multiprocessing architecture. Osterman said SQL Server for NT has enabled Air France to deliver reports in less than 15 minutes that took 24 to 48

hours using Henco Software, Inc.'s Info-DB+ database on a Digital Equipment Corp. Vax 4300 processor.

According to the Transaction Processing Performance Council's (TPC) B series of benchmarks, SQL Server for NT can handle 226 transactions per second on a Compaq Computer Corp. ProLiant Dual Pentium-66 multi-processor system. This outpaces the performance of most Unix databases. For example, Informix Software, Inc.'s Informix OnLine Version 4.0 running on Hewlett-Packard Co.'s 9000 Series 817S Unix processor supports only 64 transactions per second.

SQL Server for NT also excels in price/performance. Taking into account the cost of purchasing and maintaining a database for five years, SQL Server for Windows NT costs \$440 per transaction vs. \$1,940 for the Informix/HP 9000 setup, according to TPC-B benchmarks.

To support enterprise-wide client/server applications, SQL Server for NT provides management utilities that enable administrators to remotely monitor and control distributed servers. For example, administrators can reconfigure servers, check their status, download software to them and schedule backups via a Windows workstation. The servers can also perform unattended backups, restart after an outage and log statistics about system performance.

A utility called the SQL Object Manager also allows administrators to edit database structures, generate triggers and stored procedures, import and export database tables, among other things. In addition, the server draws on NT's security mechanisms, making it possible for users to have a single logon for both network and database services.

Finkelstein said a drawback to SQL Server for NT is that it does not capture information about individual database transactions, which makes it difficult to troubleshoot problems.

However, since SQL Server for Windows NT gives users a reason to implement Microsoft software on both ends of a client/server application, in one sense it reduces the complexity of debugging client/server problems, Finkelstein said. "At least users don't have to figure out which vendor to call to get problems fixed expeditiously."

The product is priced at \$995 for a single-user system \$2,995 for a 10-user system, \$7,995 for a departmental system of 64 users and \$14,995 for unlimited users. Upgrades from SQL Server for OS/2 cost between \$995 and \$2,995.

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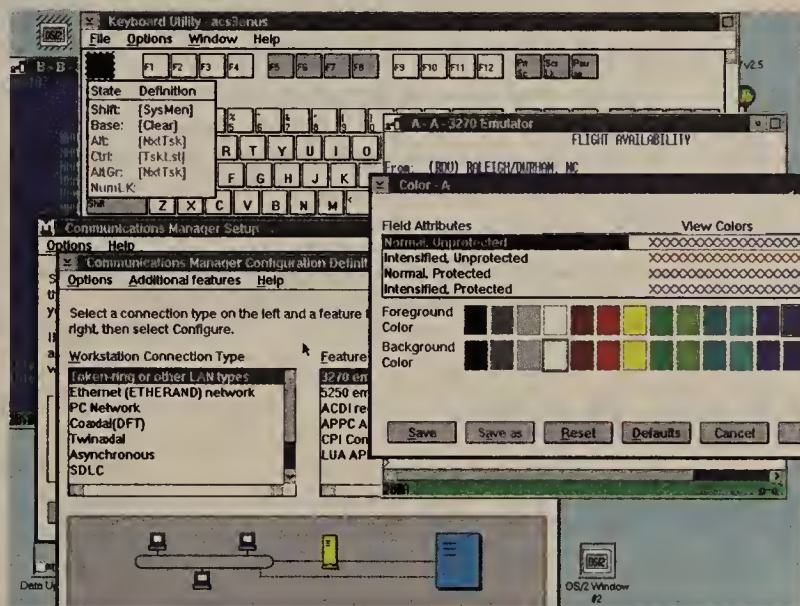
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Chipcom offers glimpse into its next-generation hub

Codeveloped with IBM, high-end box will offer a wide range of switching functions.

BY SKIP MACASKILL

Southborough, Mass.

Responding to news reports about next-generation products being developed by rivals, Chipcom Corp. last week said it will unveil a new intelligent switching hub in the first quarter of next year.

According to David Fowler, vice president of marketing, the hub will include a mix of configuration, packet and cell switching components.

"Switching is the technology that will allow users to build networks that can vary bandwidth requirements, manage devices remotely, build fault-tolerant environments and scale up to new technologies while leveraging the existing investment," Fowler said.

News of similar efforts by the company's chief rivals, Cabletron Systems, Inc. and SynOptics Communications, Inc., has leaked out over the last few months (NW, Sept. 13, page 1), and both companies are expected to roll out equipment by year end.

The new Chipcom hub, which will be introduced in the first quarter of next year, will be powered by an Asynchronous Transfer Mode (ATM) chipset developed by IBM that is the centerpiece of that company's

According to The Yankee Group, a Boston-based research firm, Chipcom Corp. in 1992 captured 12% of the high-end intelligent hub market and 24% of the switching hub market.

High-end

Switching

Transport Network Node (TNN) (NW, July 19, page 1).

IBM has been working closely with Chipcom on the new hub.

The box will have a 8G bit/sec backplane and be able to support Ethernet, token-ring and Fiber Distributed Data Interface local-area networks, as well as ATM nets through the integration of a board-level ATM switch based on the TNN.

It will support shared LANs, dedicated LANs, packet switching and cell switching.

While declining to reveal the total number of users supported by the hub or maximum LAN configurations, Fowler did say the new device would support more users than its current ONline System Concentrator. The company also declined to divulge the name of the product or any pricing parameters.

The product will be positioned as an enterprise device and packaged in a variety of models designed for work group, remote office and backbone applications.

"Traditionally, a user would take a few LANs on a couple of floors and collapse them into a central device in the basement of a building," Fowler said. "Today, we're deploying dozens of nets on each floor, effectively turning each floor into what used to be a building environment."

That change means we have to offer capabilities on the floor — switching and routing, for example — that were previously only needed in the basement."

That approach contrasts directly with SynOptics' plan, which is expected to position its LattisNet System 5000 intelligent switching hub as a collapsed backbone device in switched LAN environments where local routing will not be necessary.



David Fowler of Chipcom

"I don't believe that SynOptics' approach of all switching and no routing is the answer, because when you start talking about higher level protocol issues that crop up when a Novell server does a broadcast and other things, such as building fire walls between traditional LANs, then you're going to need routing points within the network," Fowler said.

How each company views the importance of switching is another differentiating factor, according to Fowler. "SynOptics seems to think switching will have a minimal impact at the floor level and a heavy concentration in the backbone," he said. "We see that technology as being important right down to the desktop."

Chipcom's new platform and ATM switch will be demonstrated at INTEROP 93 Europe this fall in Paris.

©Chipcom: (508) 450-8900.

SYSTEMS MANAGEMENT

Tivoli to detail new apps, big customer wins

BY JIM DUFFY

New York

Tivoli Systems, Inc. this week will announce new applications and hardware platforms for its systems manager, as well as \$1 million customer wins with GTE Corp. and Motorola, Inc.

Tivoli will also disclose that an AT&T subsidiary — AT&T CommVault Systems, Inc. — will port its network storage applications to the Tivoli management system.

A company spokesperson confirmed the details of the announcements, which will be made at the Unix Expo show here.

The new applications will run on Tivoli's Management Environment, an object-oriented systems management product for monitoring and controlling computers throughout an enterprise network.

The Tivoli Management Environment currently runs on Hewlett-Packard Co. and Sun Microsystems Computer Corp. workstations and helps users with such chores as defining and enforcing system administra-

tion policies, distributing software updates, and monitoring and correcting performance problems.

But as of this week, those functions can be performed from IBM's RISC System/6000 platform. What's more, the Tivoli software now works with the most recent versions of HP's HP-UX and Sun's Solaris operating systems.

The new applications for the Tivoli environment include mail alias management and printer queue management.

Mail alias management allows systems managers to keep track of the names and mail addresses of users on a network.

For instance, to send mail to John Doe, the user might simply type John or JD. The mail system will then translate that alias into John Doe and forward the message.

But users may share an alias or have more than one alias. If there are two Johns or JDs on the network, mail may not be delivered to the intended recipient.

So mail alias management is designed to

ensure that aliases match up to the appropriate users.

Printer queue management allows managers to start and stop print jobs, prioritize print jobs and kill queues, among other things, from the graphical user interface on a centralized Tivoli console.

With these announcements, Tivoli continues to expand its application portfolio for the Tivoli Management Environment, which is key for its customers, analysts said.

The applications will be bundled into the Tivoli Management Environment, which costs \$925 per management station and \$625 per managed client.

Mail alias is available now on SunOS and HP-UX platforms, and will be available on the RS/6000 and Solaris in December. Printer queue management will be available on all platforms in December.

©Tivoli: (512) 794-9070.

Tivoli will also disclose that an AT&T subsidiary will port its net storage application to the Tivoli management system.

NT users to get key NetWare link

BY CARYN GILLOOLY

Houston

Microsoft Corp. took another shot at Novell, Inc. last week when company executives said it would begin selling its own NetWare requester for Windows NT.

The NetWare requester for NT is software that will let customers use NT clients on NetWare local-area networks. Although Novell has stated its intention to offer an NT requester and has had beta versions out for nearly a year, it has not yet delivered.

"Microsoft wants to make sure their customers have a solution," said Steve Ballmer, executive vice president of sales and support at Microsoft, speaking at Compaq Computer Corp.'s Innovate '93 conference here last week. "Novell has not committed to a ship date for the redirector, so Microsoft is going to make one available to its customers." Ballmer added that the product is in a limited beta-test stage now and will be available to customers within 30 days.

"Novell has between 50% and 70% of the [network operating system] market. We want to be sure customers can connect NT clients to their NetWare servers," said Dwight Krossa, product manager for Windows NT at Microsoft, based in Redmond, Wash. "If customers cannot get what they want from Novell, we want them to be able to come to Microsoft."

In response, Novell last week said it is making available the fourth prerelease version of its NT requester for NetWare, dubbed NetWare Client for MS Windows NT. The company first issued a beta version of the software in October of last year and, despite three subsequent beta releases, still does not have a finished product.

"NT is a brand new operating system that has changed significantly with every release, and we've had to track that to make sure our product is compatible and tested," said Willie Donahoo, vice president of Novell's desktop systems group. "NT has only been out for a few weeks, so for us to have a kernel-level client out in that same time frame is unreasonable considering all the changes that Microsoft has made."

Novell is conducting "rigorous quality assurance testing" and is planning a 60- to 90-day beta test of its NetWare requester for NT. Commercial availability is expected in early 1994.

USERS FIRST?

"It seems to me Novell is doing everything in its power to make NT unsuccessful and Microsoft is doing everything in its power to make NetWare unsuccessful," said Paul Bandrowski, technology manager at Sara Lee Corp., based in Chicago. "They're like a bunch of kids in a sandbox throwing sand at each other. I'd like to send them both off to their rooms without any supper."

Although Novell has been seemingly lax in providing NT client capabilities, users agreed having Microsoft step in to offer the redirector is not the solution. Microsoft will have to put resources in place to support the product, which will take time, and will have the burden of updating the product each time Novell comes out with a new version of NetWare.

"The solution is to solve the gulf in the relationship, not to bring out competing products," Bandrowski said.

Microsoft's Krossa said the company has not yet determined how it will distribute the software, although it will be free of charge. He also said Microsoft has not yet determined if it will stop selling the NetWare requester for NT once Novell's product is released.

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♦ Skip MacAskill contributed to this story.



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STANDARDS

OSI waves white flag to TCP/IP camp

BY ELLEN MESSMER

Gaithersburg, Md.

Government users last week called for an end to the standards war between Open Systems Interconnection and Transmission Control Protocol/Internet Protocol, calling for the two to be merged.

Required to buy OSI products in a world dominated by TCP/IP, government users are caught in the middle of the battle and want to see peace between the protocol camps.

"We need to coordinate solutions between the Internet camp and the OSI camp," said Walt Houser, policy analyst at the Department of Veteran's Affairs, during a panel discussion at the Open Systems Environment Implementors Workshop (OIW) held here.

Houser said the government needs to define a standard way for TCP/IP and OSI to coexist so applications can be shared. He added that the government should consider using its influence to push for eventual convergence of the two standards.

The dozen OIW technical groups, hosted by the National Institute of Standards and Technology, meet regularly to hammer out details on how to trim down complex standards from the International Standards Organization.

This time-consuming process was criticized last week, as ven-

dors pointed out that the plethora of features and services packed into each standard have actually undermined their usefulness, since real-world applications do not require them much of the time.

Products that implement the full OSI stacks — which Jim Quigley, senior standards engineer at Hewlett-Packard Co., called "fat stacks" — are often too complex, costly to implement and hamper interoperability, scaring off users.

Although HP is one of the more committed OSI product vendors, Quigley admitted vendors that have seriously misjudged the ultimate goal of users.

"From the point of view of vendors, the decision was made to only have one stack and have everything in that stack — regardless of what was needed to make that application run," Quigley said.

The industry is now putting together what is being called the "minimal OSI" stack, a set of upper-layer services limited to the essentials, such as connect/disconnect and send/receive. At least 90% of applications only need these services. But vendors are not the only ones shouldering the blame for OSI's woes.

"In the OSI world, we have met the enemy, and he is us," Houser

said. "We made conformance to standards mandatory before they became available. We made vendors propose OSI products, but we failed to buy at expected levels. We focused on functionality, rather than turning out products."

OSI users, such as the state of Texas — which this summer backed off its OSI procurement policy in favor of TCP/IP — are now increasingly calling not for coexistence and transition to OSI,



STEFFERUD

but coexistence and convergence of OSI and TCP/IP. However, it is unclear how convergence could actually occur.

Einar Stefferud, president of Network Management Associates, Inc., has long been active in both the OSI and TCP/IP standards efforts. He pointed out that the

Internet Engineering Task Force (IETF), responsible for TCP/IP, has an entirely different philosophy from the international standards bodies.

The IETF long ago took on the coexistence issue by defining standard ways to process multiple protocols over TCP/IP, while the ISO has excluded any mention of alien protocols. "In the end, OSI has come out to be 'installed-base hostile,'" Stefferud said, adding, "In the Internet world, we know we can't get away from anything."

Stefferud delivered an announcement from the IETF that it will not launch any new efforts on OSI technology until it establishes a liaison relationship with the ISO. The IETF announcement means "stop, take a deep breath, and let's work together," Stefferud said. ■

Pinpoint boasts that its service has a capacity of 360K bit/sec, which is high in the radio packet world where 19.2K bit/sec is tops. But the company will not make the full capacity available to each user. In order to support up to one million users per market, Pinpoint



TAYLOR

plans to make less than 1% of that bandwidth — 2,400 bit/sec — available to each user at a time.

Although targeted at fleet management, Pinpoint's service could be used for other applications, said company President Charles Taylor. For example, it could handle a credit card transaction faster than a regular phone line, he said. And the service will be priced at nearly one-tenth that charged by competitors such as RAM Mobile Data, Inc. or ARDIS Co.

Pinpoint also promises its modems, based on technology the

See Pinpoint, page 65

Banyan widens support for RAID fault tolerance

BY CHRISTINE BURNS

Westborough, Mass.

Banyan Systems, Inc. last week released a new version of VINES that lets users take advantage of emerging technologies such as Redundant Array of Inexpensive Disks (RAID) and high-capacity tape storage systems, as well as fast SCSI-2 drives.

VINES 5.53 contains device drivers that let Banyan customers use Compaq Computer Corp., Dell Computer Corp. and Mylex Corp. RAID fault-tolerant systems, along with more than a dozen high-speed adapters and high-capacity storage devices from different manufacturers (see graphic, this page).

"This release makes some significant headway in supporting cutting-edge technologies that our customers want to use in their networks," according to Pam Campagna, product-line manager for VINES at Banyan.

This is the third VINES release issued this year. Unveiled in January, VINES 5.50 featured StreetTalk III, the latest rendition of Banyan's global directory service.

VINES 5.52(5) was released in May with several fixes for problems in the earlier version. This is the first time, however, that Banyan has relied on vendors to test products for compatibility with VINES, rather than going to beta testing.

All of the hardware configurations tested via this partnership program have been certified for interoperability with VINES 5.53.

NECESSARY RAID SUPPORT

Campagna said RAID support is the most important element of VINES 5.53 for Banyan customers.

RAID technology provides various levels of fault tolerance by striping file server data across multiple disks, letting all data be restored in the event one drive fails.

In the past, VINES users could only get RAID support through third-party products. But VINES 5.53 contains device drivers for Compaq's Smart Small Computer Systems Interface (SCSI) Array controller, Dell's SCSI Array and Drive Array adapters, and Mylex Corp.'s Dual-Attachment Concentrator 960 family of Extended Industry Standard Architecture SCSI disk array adapters.

With the addition of drivers for the Smart SCSI Array controller, VINES users can tap the RAID functionality of Compaq's SystemPro superserver, while the Dell adapter support

lets them use Dell's RAID-enabled server line.

The Mylex adapters will let VINES access the RAID capabilities inherent in Hewlett-Packard Co., Intel Corp. and AST Research, Inc. systems.

Stan Schatt, an analyst in the Santa Clara, Calif.-based consultancy Info-Corp, said RAID fault tolerance is an essential element for enterprise nets. He added that Banyan is not the first firm to offer networkwide RAID support; Novell, Inc. already provides that

VINES branches out

Banyan widens peripheral support for VINES.

New RAID adapters supported:

- Compaq Computer Corp. Smart Small Computer System Interface (SCSI) Array controller
- Dell Computer Corp. SCSI Array and Drive Array adapters
- Mylex Corp. DAC 960 family of Extended Industry Standard Architecture SCSI disk array adapters for Intel Corp., Hewlett-Packard Co. and AST Research, Inc. systems

New SCSI products supported:

- Adaptec, Inc. AHA-2740 SCSI adapter and AIC-7770 on-board chipset
- Compaq integrated fast SCSI-2 Controller for Compaq ProSignia and Integrated SCSI-2 Options Port for Compaq SystemPro/XL
- NCR Corp. 53C94 SCSI chipset
- Ing. C. Olivetti & Co. ESC-1 and ESC-2 SCSI adapters

New backup tape drives supported:

- Exabyte Corp. EXB-8500, -8204, -8500 and -8505 Models
- HP Models 35450A, 35470A and 35480
- IBM 3532 Model 023 and 3445 Model 001

New LAN cards supported:

- Cabletron Systems, Inc. Ethernet adapters
- HP Ethernet EtherTwist adapters
- NCR WaveLAN wireless network adapter

SOURCE: BANYAN SYSTEMS, INC., WESTBOROUGH, MASS.
GRAPHIC BY TERRI MITCHELL

capability in NetWare 4.0.

"This is not giving Banyan a leg up, it's just leveling the playing field," Schatt said.

VINES 5.53 also broadens the number of SCSI adapters that can be used in Banyan networks, including support for several devices that allow data transfer rates of up to 10M byte/sec. In addition, Banyan has increased its tape storage capacity on VINES nets with support for Exabyte Corp., HP and IBM 4mm tape drives that can store up to 10G bytes of data.

VINES 5.53 includes native driver support for Cabletron Systems, Inc. and HP Ethernet cards and NCR Corp.'s WaveLAN wireless adapters. These cards were previously supported by Banyan via a patch to VINES 5.52(5), issued in May.

VINES 5.53 is available now free of charge to VINES customers that subscribe to Banyan's Value Investment Program.

Customers that do not subscribe to the program will be charged an upgrade fee ranging from \$3,995 to \$13,995, depending on the number of end users on their nets.

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Comments

If you have a comment on this or any other article, drop us a fax at (508) 820-3467 or call (800) 622-1108, Ext. 487.

Pinpoint showcases wireless technology

ELLEN MESSMER

Arlington, Va.

Pinpoint Communications, Inc., a Richardson, Texas-based start-up, last week gave its first public demonstration here of its new wireless packet data technology that combines a vehicle location feature with two-way messaging.

Intended primarily for fleet management applications, the Pinpoint wireless service will let mobile data users employing laptops equipped with Pinpoint modems download information from databases or on-line services via a planned gateway.

Pinpoint demonstrated its service from vans roaming the city equipped with laptops and prototype wireless modems. Four base stations equipped with antennas, perched for the demo on top of

prominent buildings, worked like radar to detect where the vans were heading.

The service works on the principle that a vehicle be within range of at least three antennas so that its location can be determined by triangulation.

Computers in the vehicles and at an Arlington hotel, which was used as the stationary base for the demo, displayed electronic maps based on software from Visual Data Systems, Inc. and Roadshow International, Inc. The computers identified each vehicle's movements and allowed users to transmit messages between the vans and the base station.

3Com offers new mgmt. applications

BY SKIP MACASKILL

Santa Clara, Calif.

3Com Corp. this week is expected to roll out a suite of management applications designed to give net administrators control over different portions of the enterprise network, including work groups, remote offices, backbones and wide-area segments.

The Transcend applications will allow net managers to manage groups of individual devices as a logical network segment, correlating information culled from the machines into a single management view. For example, a net manager could correlate two local-area networks on one floor to create a logical LAN management view or manage all routers in another.

"Transcend gives net managers the flexibility to group different network devices into logical connectivity systems and look at management data that relates to those devices as a single network," said Raj Dhingra, marketing manager at 3Com.

Transcend applications interact with 3Com SmartAgents, software that resides on 3Com hubs, bridge/routers and adapters, and compiles configuration, event and performance data.

While endorsing the concept, analysts said the announcement was ultimately targeted at 3Com users.

"There is no question people are looking for a more consolidated view of their networks, and the way to do that is through applications that piece together different alarms and alerts," said David Passmore, vice president and service director of the local-area communications group at Gartner Group, Inc., a consultancy in Stamford, Conn.

"The limiting factor is the dependence of the applications on the 3Com agents built into the hardware," he said. "If they could get it to work across generic SNMP devices, they'd really have something."

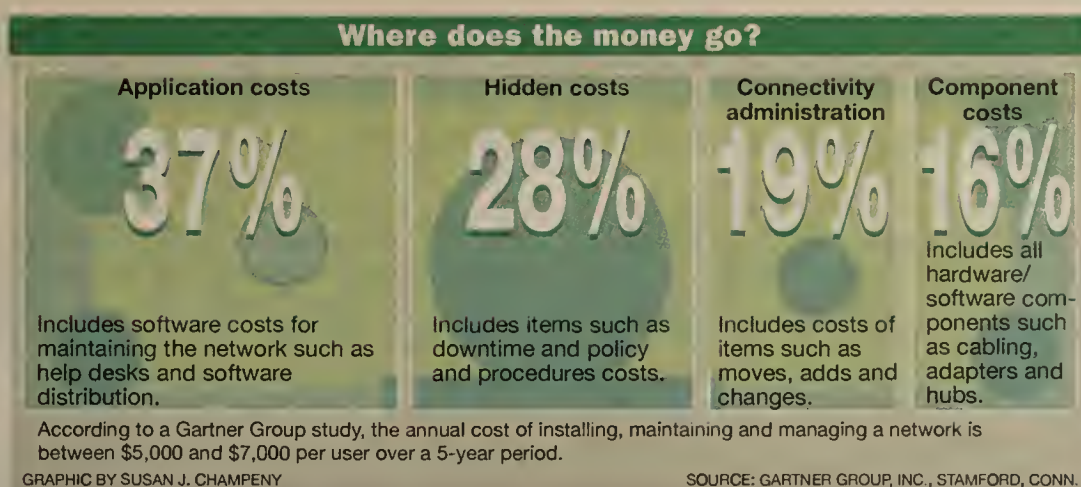
The new applications will provide a range of information and features, including topological maps showing the status of interconnected devices and end-to-end troubleshooting.

They also support so-called autothresholding capabilities, which allow performance thresholds to be set automatically based on a sampling of traffic from a logical group of devices.

A suite of Transcend applications will be available in four different areas: work group, remote office, backbone and wide-area network.

The offerings will support a variety of Unix-based net management platforms, such as SunConnect SunNet Manager, Hewlett-Packard Co. OpenView and IBM NetView/6000, as well as personal computer-based platforms, including Microsoft Corp. Windows and Windows NT, Novell, Inc. NetWare Management System, and OS/2 environments.

3Com next week will announce the first two Transcend applications. Transcend Link-Builder Flexible Media Stack (FMS) for Windows is designed for the company's FMS stackable hub and will give net managers a view of



work groups comprising the FMS and attached devices.

Available in the fourth quarter, it will cost \$495.

The company will also introduce Transcend NetBuilder Manager for SunNet Manager, which will provide an internetworking view of routers, including those supporting backbone links or in remote offices. Also available in the fourth quarter, it will cost \$3,000.

The company will roll out Transcend applications and upgrade SmartAgent software for other platforms and devices throughout 1994.

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band, ATM-based switching network."

Sprint's first step will be the movement of the circuit-switched data traffic onto a new data subnetwork within its fiber backbone, a network anchored by Northern Telecom, Inc. DMS central office switches.

The data subnetwork has been architected to be integrated with voice services, including VPN, running over the parent network. "For order entry to the backside of billing, the customer is getting an integrated set of services," said Bernie Schneider, director of product management at Sprint.

Today, unlike AT&T and MCI, Sprint carries voice and circuit-switched data over the same network. That net was designed and optimized for carrying digital traffic regardless of its type.

"It's the old 'bits are bits' argument," said L. Thomas Walton, president of Walton and Walton Associates, a consulting firm in Richmond, Va. "The idea was to create a network that could carry everything — voice, data, video, whatever — which initially was very appealing."

But to offer switched data services this way, Sprint required users to disable echo cancella-

call.

"In the end, the new network architecture guarantees clear connections for 56K and 64K bit/sec, so Sprint users should be excited," he said.

As a result of Project Diamond, Sprint will be able to offer a generally available switched digital offering. Today, the service is mostly limited to customers of VPN, constraining it to the high end of the market.

Sprint is expected to add this switched digital services product line by year end to Clarity — an umbrella service, including outbound and inbound voice, calling card, X.25, frame relay and other products targeted at midsize companies — and The Most, a lower end offering, which includes a mix of outbound and inbound products.

Sprint will also improve and broaden its support for switched access to the network. With the Diamond-based network, Sprint will be able to support switched 56 access in most local telephone territories.

The key for all of this new functionality will be the seamless interoperability of the various services on the Diamond platform. "Anyone will be able to talk with anyone," Schneider said.

The new network configuration might put price pressure on the switched services lineup. Since early in its history, Sprint has championed the concept of "data for the price of voice," a concept espoused by MCI, as well. AT&T, on the other hand, has charged its customers a premium for carrying circuit-switched data traffic.

Sprint is mum on pricing changes for circuit-switched data services, but the historical mandate that data should always be offered at the same price as voice seems to be gone. "Our underlying philosophy is that pricing should reflect the costs of providing the service, which may mean pricing voice and data at different rates," Schneider said.

VPN EVOLUTION

Sprint is ready to boost its VPN service, as well. Today, the intelligence for routing VPN calls is housed in the Northern Telecom switches at the edge of the network. This limits Sprint's customer responsiveness since customer changes need to be downloaded to all switches, instead of to a centralized database. Unless there is an emergency, this takes place once a day.

Also, Sprint is reliant on Northern Telecom for any modifications to the service logic — the actual programming that dictates how calls are processed for each customer — contained in the switches.

Under Project Darwin, Sprint will migrate all VPN customers to a new signal control point-based IN network that will take key service logic out of the Northern Telecom DMS switches and place it in centralized databases for quicker and more sophisticated call handling (see graphic, this page).

Like other interexchange carriers, Sprint has deployed its own version of an intelligent network architecture. "We were looking at advanced intelligent network services [such as those proposed by Bell Communications Research] but could not afford to wait for the i's

to be dotted and the t's crossed on the standards," Pearse said.

Affected products of this new IN implementation include 800 services and calling cards, not just VPN, said Marcus Canipe, director of product marketing. "All of the services will see improvement." These improvements will come first in flexibility and later in new features and functionality.

The impact to customers will be almost immediate. Customers will find that Sprint can react quicker to customer- and application-specific requests. Until now, anything special could take as long as two years to develop since Sprint had to go through Northern Telecom for the changes.

"We hope to slash development cycles by as much as 80% by making use of multiple sources for service logic code and through improved business processes so that customers can get what they need faster," Canipe said.

Sprint's migration to the VPN IN platform begins with alpha and beta testing in November, with customer migrations occurring soon thereafter. Sprint expects to support all new customers on the network in the second quarter of 1994.

"The migration of existing customers may take at least a year," Canipe said.

End users should not expect price decreases from the new capability, however. Sprint's pricing is expected to be unaffected by the changes.

In fact, virtual network prices for all carriers are increasing by about 5% a year.

BILLING MOVES

At the same time Sprint is moving VPN to a new IN platform, it is expected to start migrating VPN customers to a new billing system, Sprint's IPS biller, which is already used for all other Sprint circuit-switched services.

Historically, high-end customers have been billed out of Sprint's NAD billing system, which is used to generate customized invoices and reports for Sprint's high-end services, including VPN, 800 services and calling cards. IPS will allow Sprint to consolidate end-

user accounts across the majority of its services while taking advantage of the innate sophistication of the IPS system.

Sprint's IPS system is considered one of the leading invoicing platforms in the industry and is capable of multilingual, multicurrency invoicing and reporting — a key feature for international customers. Earlier this year, the company began to offer VPN customers billing data on CDROM through its personal computer-based reporting package, FONVIEW.

Sprint has already begun making use of IPS for some of its business customers. VPN customers are expected to begin receiving IPS-generated bills in a phased cutover beginning in the first quarter of 1994.

"To say we are excited to be moving to IPS is an understatement," said Howard Hunter, corporate manager of telecommunications and computing at Occidental Petroleum Corp. in Los Angeles. "The greater range of reporting, flexibility and coverage of services will allow us to make strategic use of our bill in ways we have never before explored."

THE BIG PICTURE

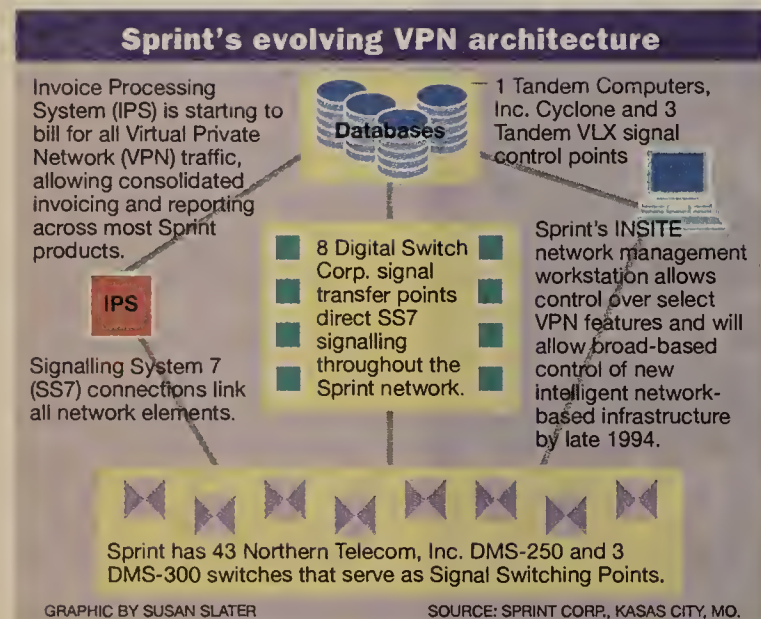
These moves in aggregate represent a major initiative and represent more than two years of planning and implementation by Sprint to upgrade its network to meet the growing sophistication of end-user requirements.

In some ways, it may be argued that Sprint is catching up to AT&T and MCI with these moves.

After all, both have had a separate switched data network and an IN-based virtual network service for some time.

Historically, network development at MCI and AT&T has been fairly in step, while Sprint's technological development can be best categorized as leapfrogging in nature. Sprint's moves here are designed to make Sprint more agile than either MCI or AT&T.

◆ Briere is president of TeleChoice, Inc., a Verona, N.J., consultancy specializing in intelligent networks, services and applications. He can be reached at (201) 239-0700.



tion features in the Sprint network, which are used to support voice. Customer applications had to be adjusted to send a 2100-Hz disabling tone into the network before each data session, and for some customers that meant purchasing echo canceling equipment.

Sprint also found that it was difficult to adequately test its network when switched data problems occurred. "If you had an application making use of an inverse multiplexer for Nx56 service, it was hard to troubleshoot those when individual calls failed," explained Schneider, adding that this problem is not unique to Sprint.

Industry observers say that this limited customer acceptance of the products. "On the one hand, by having all of the data and voice traffic on one trunking network, data calls are no more expensive than voice calls," said Roderick Randall, cofounder and vice president of marketing/business development for Teleos Communications, Inc., a manufacturer of network access equipment.

On the other hand, having to use disabling tones is a risky proposition. "You are not always guaranteed that the echo cancelers will disable on receipt of the 2100-Hz tone," Randall said. "Also, even if you get the initial connection through, it's possible for echo cancelers to kick in on their own, thereby losing the

Sprint moves to SONET net

The changes occurring in the Sprint Corp. circuit-switched network are important to nearly every Sprint end user, but what has Sprint's biggest customers salivating is the move to an all-SONET broadband ATM-based switching network.

Sprint has begun installing its Asynchronous Transfer Mode switches in strategic areas of the country and in August announced commercial availability of the service. End-to-end ATM service will be the first thing launched on this broadband fabric, followed by internetworking with other high-end data services, including frame relay, Internet Protocol and Switched Multi-megabit Data Service.

Coinciding with that deployment, Sprint will be examining the use of the ATM switching and Synchronous Optical Network (SONET) backbone for voice and circuit-switched data transport, which Sprint will start trialing in the laboratories next year.

"Six months ago, the common the-

ory in the industry was that it would not be economical to place the constant bit rate services, such as voice and video-conferencing applications, on the SONET backbone, but technology is changing that attitude fast," said Steve Pearse, vice president of technology planning.

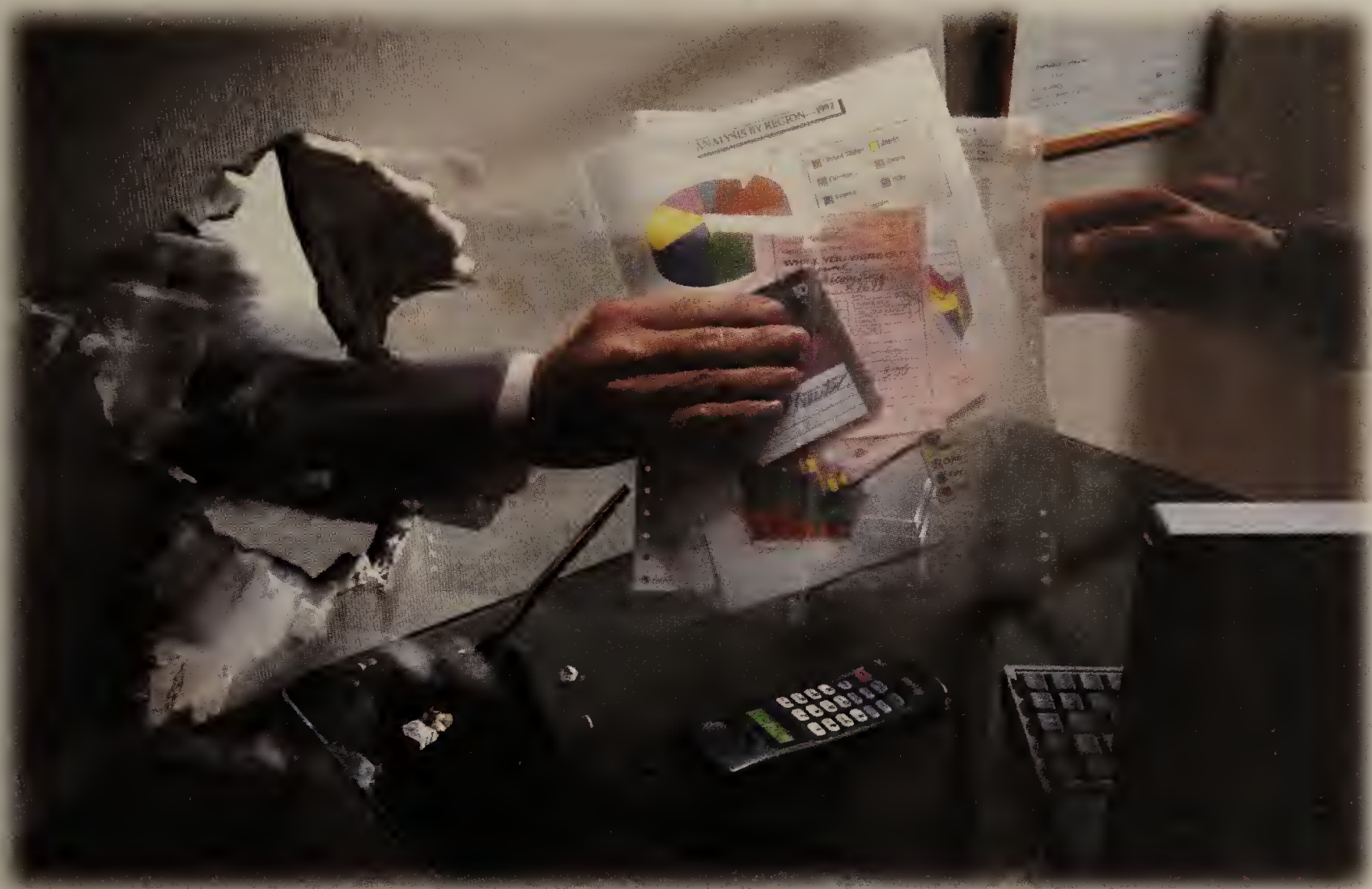
According to Pearse, Sprint is designing network and operational support systems to take advantage of the SONET technology.

"We are engineering our customer service provisioning systems to allow for real-time service provisioning under the SONET environment and changing our front-end processes to allow a smooth interface directly into the network itself."

Most attractive to customers is the survivability of the network. "Our plan is to install four-fiber, bidirectional line-switched ring technology that will allow restoration on the order of 50 msec."

BY DANIEL BRIERE

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BRIEFS

IBM is offering a specially priced high-speed channel connection package for linking local-area networks with System/390 mainframes. The package, known as S/390 LAN Server Promotion, includes IBM's LAN Resource Extension and Services (LANRES) or LAN File Services (LANFS) mainframe software, OS/2 LAN Server software, MicroChannel-to-Mainframe Connection adapter and a bus and tag cable for connecting a workstation to the mainframe.

LANRES and LANFS let the mainframe act as a server for Novell, Inc. NetWare and OS/2 LAN Server nets, respectively. The package is available for \$14,694. Separately, the products would cost more than \$16,000.

IBM: (800) 426-2255.

Proteon, Inc. has won a network installation contract with Westpac bank of Australia that, when completed, will include as many as 1,000 Proteon routers.

Westpac, whose 1,000-branch retail network supports IBM 4700 branch controllers and terminals, has already installed Proteon's high-end CNX 500 routers to interconnect its mainframe sites. Next, mid- and low-end Proteon routers and hubs will be deployed in regional and remote sites.

Newport Systems Solutions, Inc. (NSS) has announced a data compression module for its LAN²LAN/Multi-Protocol Router (MPR) that provides an average compression ratio of 4-to-1 at line speeds up to T-1. Each HDCM module supports one or two wide-area network ports with a combined transmission rate of up to 1.5M bit/sec, thereby allowing an effective throughput rate of 6M bit/sec at the average ratio of 4-to-1.

The LAN²LAN/MPR 3.0 is available with the HDCM preinstalled for \$3,995. An HDCM upgrade kit costs \$1,995.

NSS: (714) 752-1511.

Opposition strong to govern licensing plan

BY ELLEN MESSMER

Washington, D.C.

Calling the proposal illegal, industry and users are vehemently opposing the Department of Commerce's plan to give Public Key Partners, Inc. (PKP) the rights to the technology used in the proposed Digital Signature Standard (DSS).

The licensing plan was proposed last June to resolve the two-year patent dispute over DSS between the government and PKP, which holds important patents on public-key cryptography technology. Now, facing a barrage of legal challenges to the plan, the Commerce Department is taking a long, hard look at how it should proceed on DSS, further delaying use of a technology expected to be widely deployed in both defense and civilian applications.

A feature of public-key encryption technology, the digital signature, does not encrypt data but lets users "sign" electronic documents as well as verify document integrity and the sender's identity.

In 1991, the National Institute of Standards and Technology (NIST) unveiled DSS, saying it would be the federal standard for nonclassified but sensitive applications, but PKP and German professor Claus Schnorr immediately claimed that DSS infringed on patents they held. Later, the National Security Agency, not NIST, claimed responsibility for creating DSS, and its main component the Digital Signature Algorithm (DSA).

Key licensing terms for the Digital Signature Algorithm

License execution fee:

Licensees with annual gross revenues over \$1 million:	\$25,000
Licensees with annual gross revenues under \$1 million:	\$10,000

Royalty rates:

Net sales price per licensed product	Hardware	Software
Less than \$1,000	2.5%	5%
\$1,000+	\$25 plus 1% over \$1,000	\$50 plus 1% over \$1,000

Sales price must be set at 125% of the licensee's full cost of production.

SOURCE: DEPARTMENT OF COMMERCE, WASHINGTON, D.C.
GRAPHIC BY SUSAN J. CHAMPENY

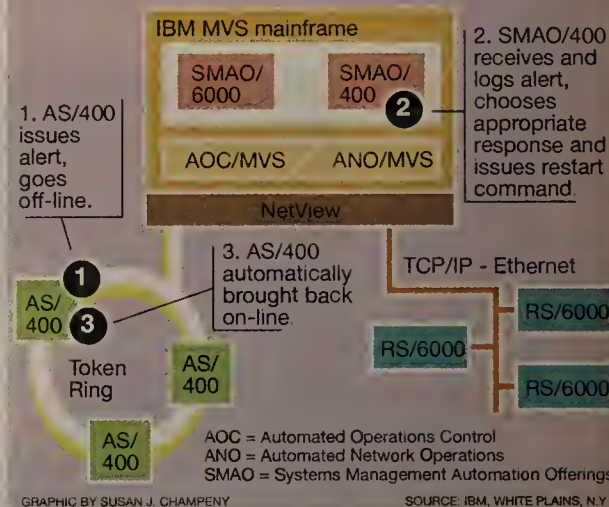
In comments submitted to the Commerce Department, dozens of companies and individuals have spoken out against the plan to give exclusive rights over DSS to PKP, calling it a government "giveaway" that puts monopoly control over use of DSS in the hands of single company.

Citibank, IBM, AT&T, Bell Communications Research, Inc., the Software Publishing Association and the Computer Business and Equipment Manufacturers Association, among others, assert

See **Opposition**, page 16

IBM offers hands-off control

SMAO simplifies AS/400, RS/6000 management.



IBM software offers users automation

BY MICHAEL COONEY

Raleigh, N.C.

IBM has announced new software packages that let users automate and centrally manage distributed Application System/400 or RISC System/6000 machines distributed throughout an enterprise network.

The SystemView Systems Management Automation Offerings (SMAO)/400 and SMAO/6000 build on existing IBM mainframe automation products to let users automatically monitor, control and measure the performance of AS/400 minicomputers and RS/6000 workstations and servers.

SystemView is IBM's all-encompassing systems and network management architecture under which falls a variety of products designed to manage enterprise-wide multivendor information systems.

SMAO is an MVS mainframe application that uses IBM's existing Automated Operations Control (AOC)/MVS or Automated Network Operations (ANO)/MVS to support automated procedures that can handle everything from problem notification and net performance monitoring to scheduling unattended file transfers. A piece of SMAO code also resides on all AS/400s and RS/6000s using the SMAO application.

AOC/MVS and ANO/MVS are NetView applications designed to let users automate mainframe console and Systems Network Architecture net management operations.

"SMAO is a centralized systems management tool for decentralized environments," said Thomas Larnfeldt, SMAO development manager.

SMAO works by monitoring ANO/MVS or AOC/MVS for AS/400 or RS/6000 traffic. If an AS/400 or RS/6000 fails or performance from a downstream node begins to falter, SMAO can kick off an automated response to the problem. For example, if an AS/400 node fails, SMAO/400 can automatically restart the device from the central location without operator intervention.

SMAO/6000 can monitor disk space on RS/6000 machines in the network. If, for example, a memory threshold is reached, SMAO/6000 automatically alerts the NetView operator for action.

See **IBM**, page 17

Compuware's EcoChargeback helps users track database usage

Supports tracking, billing to aid in chargebacks.

BY JIM DUFFY

Farmington Hills, Mich.

Compuware Corp. last week rolled out software that allows system managers to track database usage so they can invoice the appropriate users.

Called EcoChargeback, the software runs as an application on a Compuware EcoSystems centralized management console and as agent software on Unix clients and servers as well as DOS personal computers.

EcoCharge allows system managers to collect database resource usage information from Unix-based database servers and the clients that access those servers. That

enables managers to pinpoint which users and applications are exhausting database resources.

The program, which works only with Oracle Corp. databases on Transmission Control Protocol/Internet Protocol nets, can also be used to locate those applications and SQL calls that are causing performance bottlenecks in the network.

EcoChargeback gleans data from database servers and clients, including CPU, memory and disk I/O use, operating system and database logon times, disk space use and statistics such as number of transactions performed.

The program can also track how many

characters and blocks of data have been transferred between client and server, and can locate users via their Internet address.

EcoChargeback might be useful in organizations where different departments or divisions share database servers.

Current resource management tools do not show which specific applications or users are driving database cycle consumption, Compuware officials claim.

As a result, EcoChargeback allows managers to bill for database access and retrieval based on user or department, with rates determined by system or time of day.

EcoChargeback is the second management product unveiled by Compuware in the past month.

The other is a client/server package, called RemoteControl/2, that controls OS/2-based nodes on remote local-area networks (NW, Sept. 6, page 15).

EcoChargeback Version 1.0 is available now. Pricing starts at \$8,000.

©Compuware: (313) 737-2718.

1-800
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What they *don't* tell you is that any hardware-upgrading can be a long, slow laborious process. Chip swaps and board replacements can disrupt your move to V.Fast by weeks. Even longer if a

complete product replacement is needed.

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Far easier and far more cost effective than hardware upgrades, the Racal-Datacom ALM 3239 has on-board micro-processors

that accept changes instantly.

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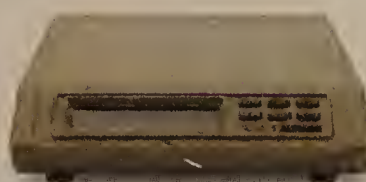
few minutes via the telephone line. There's no exchanging of hardware. There's no on-site disruption.

The ALM 3239 supports DTE speeds up to 115,200 bps and can be remotely monitored, diagnosed, controlled and configured non-interruptively through the CMS® 400 network management system.

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Is time running o



ut for downtime?

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Opposition

Continued from page 12

that resolution of a patent dispute is not sufficient reason to justify assigning exclusive rights to PKP.

The government can only grant an exclusive license over federally developed technology to a single company when doing so would help bring the invented technology into practical use or promote public use of it.

"Resolving a patent dispute, while possibly in the best interest of the federal government,

does not take into consideration the ability of PKP to bring the invention to practice," IBM said in comments submitted to the Commerce Department.

PKP holds patents on RSA Data Security, Inc. public-key technology and recently obtained rights to the digital signature algorithm developed by Schnorr.

Trusted Information Systems, Inc. President Steven Walker pointed out that RSA-related patents expire in four years, while the Schnorr patent expires in the year 2008. Giving PKP an exclusive license to the recently obtained U.S. government patent on DSS

would extend PKP's cryptography rights for another 17 years.

Many arguing against the licensing plan pointed out that the RSA technology was developed under a federal grant, and, therefore, the government has royalty-free access to it; however, the government has no rights to Schnorr's digital signature technology.

Giving PKP the exclusive license to DSS is contrary to law because PKP is simply a patent licensing entity, AT&T told the Commerce Department. "It does not manufacture equipment," AT&T said. "It does not provide encryption services. It merely purchases

rights to patents and then turns around to license those rights for a fee to the public." AT&T pointed out that commercialization of DSS has already occurred.

Deerfield, Ill.-based Information Security Corp. took in good faith NIST's original assertion that DSS would be made freely available and royalty-free, and have implemented it in products. "NIST was aware of our efforts and did not indicate at any time that the practice of the DSA would require royalty payments for commercial sale," said Thomas Venn, president of the company.

Many vendors oppose the licensing terms that PKP has suggested it would impose on vendors for using the DSA (see graphic, page 12). Bellcore, in its comments, labelled these terms "oppressive." The European Association of Manufacturers of Business Machines and Information Technology Industry (EUROBIT) said the proposed licensing terms did not seem to be reasonable.

Motorola, Inc., which has several products under development that will use the DSA, claims that an exclusive license to PKP may increase development costs and has product prices to end users.

Vendors of smart cards, which foresee use of digital signatures on cards to check user identity, also complained. "The amount of royalties and the cost per-certificate fees suggested by PKP goes well beyond the traditional licensing condition in the smart card industry practiced for large-scale application," said Gilles Lisimaque, executive vice president for advanced developments at Gemplus Card International.

Users also expressed deep concerns about the licensing arrangement, which in theory would not apply to government use, but would affect the private sector. Citibank noted there were many "ambiguities" in PKP's proposed terms for use of DSA.

In particular, the \$1 per-certificate fee that PKP wants to charge to any provider of commercial encryption services raises serious questions for financial institutions, Citibank noted.

If a financial institution certifies a signature's authenticity but charges no discrete fee for the service, Citibank asked, is this institution considered to be a "provider of commercial certification service" under the proposed rules?

And if a financial institution certifies a signature's authenticity pursuant to government regulation, does that use of DSA qualify as U.S. federal, state and local government use?

The myriad issues raised about the government's plans to settle the fight with PKP are now being reviewed by the Commerce Department. Mike Rubin, deputy chief counsel at the Commerce Department, said there appear to be only a few ways to end the battle with PKP.

If the licensing method seems untenable, Rubin said, the government can either pay PKP the "exorbitant amount of money they demand — hundreds of millions of dollars, fight for years in court with an uncertain outcome, or do nothing and not have a digital signature." ■

Motorola, which has several products under development that will use the DSA, said an exclusive license to PKP may increase development costs.

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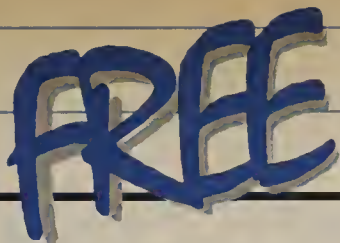


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 Division/Department.....
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 City..... State..... Zip.....

Is this your Business Address? Yes ☐ No ☐
 Please Answer ALL Questions, Sign and Date the Form.

1 Industry: (check one only)

- 01. ☐ Manufacturers (other than Computer/Communications)
- 02. ☐ Finance/Banking
- 03. ☐ Insurance
- 04. ☐ Real Estate
- 05. ☐ Healthcare Services
- 06. ☐ Legal
- 07. ☐ Hospitality
- 08. ☐ Retail/Wholesale Trade/Business Services
- 09. ☐ Transportation
- 10. ☐ Utilities
- 11. ☐ Education
- 12. ☐ Process Industries (Mining/Construction/
Petroleum Refining/Agriculture/Forestry)
- 13. ☐ Government, State/Local
- 14. ☐ Government, Federal
- 15. ☐ Military
- 16. ☐ Aerospace
- 17. ☐ Consultants (Independent)
- 18. ☐ Carriers
- 19. ☐ Interconnects
- 20. ☐ Manufacturers (Computer/Communications)
- 21. ☐ VAR/VAD/VAN/ Systems Houses
- 22. ☐ Distributors, Computer Related
- 23. ☐ Distributors, Communications Related
- 24. ☐ Other

2 What is your job function? (check one only)

NETWORKING MANAGEMENT

- 1. ☐ Networking Mgmt.
- 2. ☐ LAN Mgmt.
- 3. ☐ Datacom/Telecom Mgmt.
- 4. ☐ Engineering Mgmt.

MIS MANAGEMENT

- 5. ☐ MIS, IS, IT Mgmt.
- 6. ☐ Engineering Mgmt.

CORPORATE MANAGEMENT

- 7. ☐ Corporate Mgmt. (CIO, CEO, Pres., VP, Dir., Mgr., Financial Mgmt.)
- 8. ☐ Consultant (Independent)
- 9. ☐ Other

3 My responsibilities include: (check one only)

- 1. ☐ LANs/ Internetworking/ WANs
- 2. ☐ LANs/ Internetworking
- 3. ☐ LANs
- 4. ☐ WANs
- 5. ☐ None

4 What is the total number of sites for which you have purchase influence? (check one only)

- 1. ☐ 100+
- 2. ☐ 50 - 99
- 3. ☐ 20 - 49
- 4. ☐ 10 - 19
- 5. ☐ 2 - 9
- 6. ☐ 1
- 7. ☐ None

5 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

- | | |
|--|---|
| A. Scope
(check one only) | B. Involvement
(check all that apply) |
| 1. ☐ Corporatewide | 1. ☐ Recommend/Specify |
| 2. ☐ Multienterprise
(consultants) | 2. ☐ Approve |
| 3. ☐ Departmental | 3. ☐ Evaluate |
| | 4. ☐ None (A or B) |

6 Check all that apply in Columns A and B:

- A. I am involved in the purchase of the following products/services.
- B. I plan to purchase the following products/services in the next year.

- | | |
|------------------------------|------------------------------|
| Involved | Plan to Purchase |
| A | B |
| 01. ☐ | 01. ☐ |
| 02. ☐ | 02. ☐ |
| 03. ☐ | 03. ☐ |
| 04. ☐ | 04. ☐ |
| 05. ☐ | 05. ☐ |
| 06. ☐ | 06. ☐ |
| 07. ☐ | 07. ☐ |
| 08. ☐ | 08. ☐ |
| 09. ☐ | 09. ☐ |
| 10. ☐ | 10. ☐ |
| 11. ☐ | 11. ☐ |
| 12. ☐ | 12. ☐ |
| 13. ☐ | 13. ☐ |
| 14. ☐ | 14. ☐ |
| 15. ☐ | 15. ☐ |
| 16. ☐ | 16. ☐ |
| 17. ☐ | 17. ☐ |

- | | |
|------------------------------|------------------------------|
| A | B |
| 18. ☐ | 18. ☐ |
| 19. ☐ | 19. ☐ |
| 20. ☐ | 20. ☐ |
| 21. ☐ | 21. ☐ |
| 22. ☐ | 22. ☐ |
| 23. ☐ | 23. ☐ |
| 24. ☐ | 24. ☐ |

Plan to Purchase

- | | |
|------------------------------|------------------------------|
| A | B |
| 25. ☐ | 25. ☐ |
| 26. ☐ | 26. ☐ |
| 27. ☐ | 27. ☐ |
| 28. ☐ | 28. ☐ |
| 29. ☐ | 29. ☐ |
| 30. ☐ | 30. ☐ |
| 31. ☐ | 31. ☐ |
| 32. ☐ | 32. ☐ |
| 33. ☐ | 33. ☐ |
| 34. ☐ | 34. ☐ |
| 35. ☐ | 35. ☐ |
| 36. ☐ | 36. ☐ |
| 37. ☐ | 37. ☐ |

SOFTWARE/APPLICATIONS

- | | |
|------------------------------|------------------------------|
| A | B |
| 38. ☐ | 38. ☐ |
| 39. ☐ | 39. ☐ |
| 40. ☐ | 40. ☐ |
| 41. ☐ | 41. ☐ |
| 42. ☐ | 42. ☐ |
| 43. ☐ | 43. ☐ |
| 44. ☐ | 44. ☐ |
| 45. ☐ | 45. ☐ |
| 46. ☐ | 46. ☐ |
| 47. ☐ | 47. ☐ |
| 48. ☐ | 48. ☐ |
| 49. ☐ | 49. ☐ |
| 50. ☐ | 50. ☐ |
| 51. ☐ | 51. ☐ |
| 52. ☐ | 52. ☐ |
| 53. ☐ | 53. ☐ |
| 54. ☐ | 54. ☐ |
| 55. ☐ | 55. ☐ |

WIDE-AREA NETWORK EQUIPMENT/SERVICES

- | | |
|------------------------------|------------------------------|
| A | B |
| 56. ☐ | 56. ☐ |
| 57. ☐ | 57. ☐ |
| 58. ☐ | 58. ☐ |
| 59. ☐ | 59. ☐ |
| 60. ☐ | 60. ☐ |
| 61. ☐ | 61. ☐ |
| 62. ☐ | 62. ☐ |
| 63. ☐ | 63. ☐ |
| 64. ☐ | 64. ☐ |
| 65. ☐ | 65. ☐ |
| 66. ☐ | 66. ☐ |
| 67. ☐ | 67. ☐ |
| 68. ☐ | 68. ☐ |
| 69. ☐ | 69. ☐ |
| 70. ☐ | 70. ☐ |
| 71. ☐ | 71. ☐ |
| 72. ☐ | 72. ☐ |
| 73. ☐ | 73. ☐ |
| 74. ☐ | 74. ☐ |
| 75. ☐ | 75. ☐ |
| 76. ☐ | 76. ☐ |
| 77. ☐ | 77. ☐ |
| 78. ☐ | 78. ☐ |
| 79. ☐ | 79. ☐ |
| 80. ☐ | 80. ☐ |
| 81. ☐ | 81. ☐ |
| 82. ☐ | 82. ☐ |
| 83. ☐ | 83. ☐ |
| 84. ☐ | 84. ☐ |
| 85. ☐ | 85. ☐ |
| 86. ☐ | 86. ☐ |
| 87. ☐ | 87. ☐ |
| 88. ☐ | 88. ☐ |
| 89. ☐ | 89. ☐ |
| 90. ☐ | 90. ☐ |
| 91. ☐ | 91. ☐ |
| 92. ☐ | 92. ☐ |
| 93. ☐ | 93. ☐ |
| XX. ☐ | XX. ☐ |

7 What is the total number of A: LANs B: Workstations/Nodes in your entire organization?

- | | |
|-----------------------------|-----------------------------|
| LANs | Workstations/
Nodes |
| A | B |
| 1. ☐ | 1. ☐ |
| 2. ☐ | 2. ☐ |
| 3. ☐ | 3. ☐ |
| 4. ☐ | 4. ☐ |
| 5. ☐ | 5. ☐ |
| 6. ☐ | 6. ☐ |

8 Which of the following network platforms are currently installed/planned in the next year?

- | | |
|------------------------------|------------------------------|
| Present | Planned |
| 01. ☐ | 01. ☐ |
| 02. ☐ | 02. ☐ |
| 03. ☐ | 03. ☐ |
| 04. ☐ | 04. ☐ |
| 05. ☐ | 05. ☐ |
| 06. ☐ | 06. ☐ |

Present Planned

- 07. ☐ NOVELL IPX/SPX
- 08. ☐ APPC/APPN/LU 6.2
- 09. ☐ NETBIOS
- 10. ☐ OSI
- 11. ☐ APPLETALK
- 12. ☐ OTHER

LAN OPERATING SYSTEM

- 13. ☐ LOCALTALK (APPLETALK)
- 14. ☐ BANYAN (VINES)
- 15. ☐ DCA (IRMALAN)
- 16. ☐ DCA (10-NET)
- 17. ☐ IBM (LAN SERVER)
- 18. ☐ IBM (PC LAN PROGRAM)
- 19. ☐ MICROSOFT (LAN MANAGER)
- 20. ☐ UNGERMANN-BASS (NET/1)
- 21. ☐ NOVELL (NETWARE, 2.X, 3.X, 4.X)
- 22. ☐ PROTEON (PRONET)
- 23. ☐ SITKA (TOPS)
- 24. ☐ 3COM (3+, 3+OPEN)
- 25. ☐ ARTISOFT (LANTASTIC)
- 26. ☐ HAYES (LANSTEP)
- 27. ☐ DEC (PATHWORKS)
- 28. ☐ OTHER

LAN ENVIRONMENT

- 29. ☐ 4M TOKEN RING
- 30. ☐ 16M TOKEN RING
- 31. ☐ ARCNET
- 32. ☐ ETHERNET
- 33. ☐ STARLAN
- 34. ☐ FDDI
- 35. ☐ LOCALTALK
- 36. ☐ 10BASE-T
- 37. ☐ OTHER

OPERATING SYSTEM

- 38. ☐ DOS
- 39. ☐ UNIX/XENIX/AIX
- 40. ☐ OS/2
- 41. ☐ OS/2 2.X
- 42. ☐ MVS
- 43. ☐ VM
- 44. ☐ VMS
- 45. ☐ MACINTOSH
- 46. ☐ WINDOWS
- 47. ☐ WINDOWS NT
- 48. ☐ X WINDOWS
- 49. ☐ OTHER

9 For which areas outside of the U.S. do you have purchase influence? (check all that apply)

- 1. ☐ Europe
- 2. ☐ Asia
- 3. ☐ South America
- 4. ☐ Australia
- 5. ☐ Middle East
- 6. ☐ None

10 Which of the following hardware platforms is installed/planned in your company? (check all that apply)

	Mainframes Currently Installed	Planned Next Year	Minis Currently Installed	Planned Next Year
01. DEC	☐	☐	☐	☐
02. IBM	☐	☐	☐	☐
03. AMDAHL	☐	☐	☐	☐
04. AT&T	☐	☐	☐	☐
05. BULL HNIS	☐	☐	☐	☐
06. DATA GENERAL	☐	☐	☐	☐
07. HP	☐	☐	☐	☐
08. TANDEM	☐	☐	☐	☐
09. UNISYS	☐	☐	☐	☐
10. OTHER	☐	☐	☐	☐

MICROCOMPUTERS (fill in the numbers)

	NUMBER INSTALLED	NUMBER PLANNED NEXT YEAR
11. MACINTOSH 20, 30, 40		
12. MACINTOSH OTHER		
13. PCs BASED ON 80586	N/A	
14. PCs BASED ON 80486		
15. PCs BASED ON 80386		
16. PCs BASED ON 80286		
17. PCs BASED ON 8086/8088		
18. RISC / UNIX BASED WKSTNS		
19. OTHER		

11 Estimated value of networking equipment and services:

- A. Which you helped specify, recommended or approved in the last year?
- B. Which you plan to help specify, recommend or approve in the next year?

- | | |
|-----------------------------|-----------------------------|
| A | B |
| 1. ☐ | 1. ☐ |
| 2. ☐ | 2. ☐ |
| 3. ☐ | 3. ☐ |
| 4. ☐ | 4. ☐ |
| 5. ☐ | 5. ☐ |
| 6. ☐ | 6. ☐ |
| 7. ☐ | 7. ☐ |
| 8. ☐ | 8. ☐ |
| 9. ☐ | 9. ☐ |

12 Estimated gross annual revenue of your entire company/institution: (check one only)

- 1. ☐ Over \$10 billion
- 2. ☐ \$1 to \$9.9 billion
- 3. ☐ \$500 to \$999.9 million
- 4. ☐ \$100 to \$499.9 million
- 5. ☐ \$50 to \$99.9 million
- 6. ☐ \$10 to \$49.9 million
- 7. ☐ \$5 to \$9.9 million
- 8. ☐ \$4.9 million or less

13 Estimated number of employees for your entire corporation:

- 1. ☐ Over 10,000
- 2. ☐ 5,000 - 9,999
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NCR unveils new 3172-like processor

BY JIM DUFFY

Dayton, Ohio

At long last, NCR Corp. answered IBM's 3172 Interconnect Controller with last week's introduction of the first in a line of controllers that connect local-area networks to IBM and compatible mainframes.

NCR unveiled the Comten 5909 processor, a device that attaches token-ring and Ethernet LANs to an IBM or compatible mainframe channel, facilitating high-speed file transfers for applications such as data storage and backup, as well as file and database serving. NCR officials said the 5909 allows users to recast their large mainframe machines as LAN servers instead of deploying them in the traditional role of centralized information system hubs.

The 5909, which had been expected (NW, April 6, 1992, page 2), is the first member of NCR's new Comten 5900 line of LAN-to-mainframe connectivity products. It supports Transmission Control Protocol/Internet Protocol data exchange between LANs and mainframes, and the same channel protocol used by the 3172 Interconnect Controller.

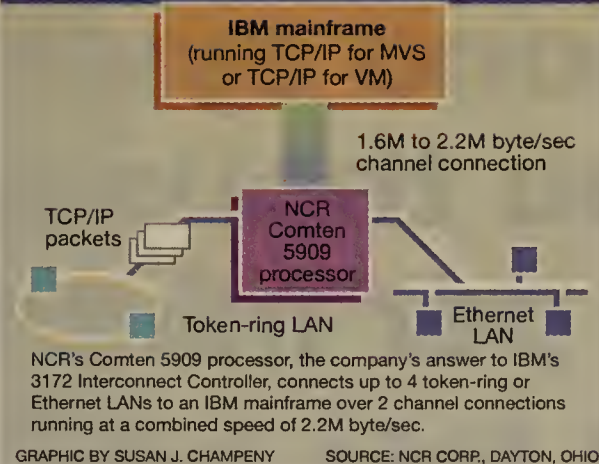
With the proliferation of LANs in mainframe sites, NCR has high hopes for its 5900 line.

The 5909 supports up to four Ethernet or token-ring interfaces and a maximum of two bus and tag channel connections to the mainframe. It runs at 1.6M byte/sec when linking a single LAN to one mainframe channel and operates at a combined speed of 2.2M byte/sec when linking two LANs to two channels.

Although the speed of an IBM bus and tag channel connection is 4.5M byte/sec, the 5909's channel throughput is comparable to IBM's 3172, said Suzanne Babich, director of product planning for NCR's communications processor business unit.

The NCR controller sports a throughput of 3,400 TCP/IP packet/sec for packet sizes of 64 bytes. It can also support from 3,000 to 25,000 Telnet terminal-

LAN meets mainframe on Channel 5909



emulation sessions.

The 5909 can also transfer data in one-tenth of a second, even when the device is 90% utilized.

On the LAN, the 5909 supports any TCP/IP package on the market, including NCR's System 3000 Unix TCP/IP implementation. For mainframes, the 5909 handles any TCP/IP package that supports the 3172 channel protocol, including IBM's TCP/IP for MVS and VM, Interlink Computer Sciences, Inc.'s SNS/TCP access product and SNS/SNA Gateway package.

IBM's 3172, meanwhile, can be configured to connect LANs to hosts or to link mainframe channels over wide-area nets. As a LAN gateway, the 3172 channel attaches IBM Token-Ring, Ethernet, Fiber Distributed Data Interface and token-bus LANs to Systems Network Architecture and TCP/IP hosts. As a remote channel-to-channel controller, the 3172 can attach two Enterprise System Connection (ESCON) or bus and tag channels to a remote host over T-1 links.

Upcoming versions of NCR's 5900 line are expected to support FDDI LANs, SNA, Internetwork Packet Exchange (IPX) and Network Basic I/O System protocols, as well as ESCON channel connections.

AT&T Paradyne, NCR's sister company, already offers remote channel-to-channel connectivity via an OEM agreement with IBM that allows it to resell the 3172. Any effort by NCR to address that market with the 5900 series would be "redundant," Babich said.

Available now, the 5909 has a starting price of \$24,000.

©NCR: (513) 445-5000.

NETWORK MANAGEMENT

NetTech to monitor NDM file transfers

BY MICHAEL COONEY

Raleigh, N.C.

Users of Sterling Software, Inc.'s Network DataMover (NDM) program can now keep a more watchful eye over their file transfers with new centralized management software from NetTech, Inc.

The firm's NDMView software lets users monitor NDM file transfers from beginning to end for performance problems or other difficulties that might interrupt data flow.

NDM is mainframe software that sets up unattended, automated file and data transfers between IBM mainframes, Application System/400s and multivendor personal computer platforms. NDM was part of the Systems Center, Inc. suite of products that Sterling bought earlier this year.

"Users can track the entire NDM process to see if the file transfer began on time and how it is performing across specific routes," said Nina Johnson, systems consultant and NDMView product manager at NetTech, which specializes in the development of software that works with IBM's NetView management system. "It also monitors for other problems that could interrupt the flow of NDM data, such as failed lines or devices."

NDMView is an MVS mainframe-

based NetView application. It works by monitoring Systems Network Architecture traffic coming through VTAM and the NDM application running on the MVS operating system. Through VTAM, it monitors the network devices, links and session paths used by NDM, as well as network status and file-transfer activity.

Relevant data is stored in NDMView's own mainframe database, and the NDMView topology is displayed on a traditional NetView 3270 screen.

"NDMView will give the 12,000 or so NDM licenses out there their first real way to monitor their environments," Nina Johnson said.

When NDMView detects a device failure or a fluctuation in a user-set performance threshold, it highlights the condition by changing color on the NetView system monitor, prompting the NetView operator to take action.

The product does not work with Sterling's Net/Master mainframe-based management platform.

According to Johnson, NDMView lets users fix file-transfer problems quicker and perhaps prevent problems from occurring by spotting performance fluctuations early.

"NDMView will give the 12,000 or so NDM licenses out there their first real way to monitor their environments," she said.

NDMView is available now for \$31,000.

©NetTech: (919) 781-7887.

CrossComm to integrate compression into routers

BY MAUREEN MOLLOY

Marlboro, Mass.

CrossComm Corp. last week announced that it will incorporate a new third-generation "supercompression" technology into its family of ILAN routers.

CrossComm said it is working with Transcend Technologies Corp., a Cleveland-based supplier of compression software, to develop a router-based compression feature that will help users trim telephone bills while increasing wide-area network data throughput.

Data compression has become an important requirement as the amount of users' internet traffic continually increases, driving up the cost of WAN links.

A data stream is compressed by eliminating redundant information, which is identified based on the stream's traffic pattern history.

In a single stream of data, this is relatively straightforward. But in a router environment that supports multiple user sessions, traffic patterns are more difficult to discern.

Transcend's ASH technology, unlike most competing schemes, is capable of compressing multiple streams of data using advanced neural network techniques.

Using the techniques, Transcend's software raises the level of predictability by learning the diverse network patterns in network data, thereby making it up to four times more compressible. Transcend's algorithm determines which data streams belong in which session and tracks each separately.

"A neural net technique uses advanced concepts to look at the data and predict what is going to happen based on past results," said Gregory

Koss, CrossComm's director of product marketing.

The ASH technology will also combine a so-called lossless data compression algorithm with the ILAN's Reduced Instruction Set Computing-based processing engine to achieve a combined compression ratio of up to 4-to-1.

Unlike a second class of compression technique that uses a so-called lossy algorithm that discards some information to compress the data, lossless data compression preserves all of the information contained within the packet. It replaces long, repeated sequences with a token that contains the repeated character as well as the number of times it is repeated. That is important since most network applications require an exact reproduction of the original data and cannot tolerate errors.

Koss said the compression feature will enable CrossComm's target customer — the IBM Systems Network Architecture user — to better transition that traffic from low-speed leased lines onto a multiprotocol backbone by combining SNA and LAN traffic with greater efficiency, obviating the need for higher speed or added WAN lines.

The new feature will be available by the end of the year as a plug-in daughterboard to the ILAN router. Pricing has not been set.

©CrossComm: (508) 481-4060.

Router vendors that support data compression:

ACC
Andrew Corp.
CrossComm Corp.
Eicon Technology Corp.
Emerging Technologies
Engage Communications, Inc.
Gandalf Systems Corp.
Microcom, Inc.
Netronix, Inc.
Networks Northwest, Inc.
Newport Systems Solutions, Inc.
RAD Network Devices, Inc.
3Com Corp.
Zenith Electronics Corp.

IBM

Continued from page 12

SMAO/400 and SMAO/6000 can reside simultaneously on the MVS mainframe. SMAO information is displayed on standard NetView screens.

In order for users to track device problems, SMAO can also open and close trouble tickets in IBM's Information/Management problem management database.

SMAO/400 performs many of the same functions as IBM's existing Automation Center/400 product, which supports automated net management operations from the AS/400 platform.

"Users of Automation Center/400 can now pass all of the data they gather onto the centrally managed SMAO/400 product," Larnefeldt said.

"Users now have the flexibility of managing their AS/400-based networks centrally from a mainframe or in a distributed fashion via Automation Center/400."

SMAO/400 and SMAO/6000 will be available Sept. 24 for \$15,000 and \$13,000, respectively. SMAO software for the distributed AS/400s and RS/6000s will cost \$1,500 and \$500, respectively.

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LOCAL NETWORKS

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BRIEFS

LanOptics, Ltd., a European provider of intelligent wiring hubs primarily for token-ring environments, has announced the formation of a U.S. subsidiary, LanOptics, Inc. It will be based in Dallas and headed up by Ed Grace, formerly senior vice president of business development at Harris Adacom Corp. The company also announced the acquisition of TIEC Computer/Communications Products, Inc., a supplier of IBM mid-range wiring hubs based in Dallas.

Racal-Datcom, Inc. last week released Version 1.3 of its LAN Performance Analyzer (LPA) software, which provides performance monitoring and analysis of local-area networks. The upgraded version can generate Systems Network Architecture alerts and decode International Standards Organization protocols, among other new features. Pricing for LPA starts at \$1,695.

Racal-Datcom: (800) 722-2555.

Grand Junction Networks, Inc. last week signed a distribution agreement with Tech Data Corp., which will resell Grand Junction's FastLink product family that combines Ethernet switching with 100M bit/sec Ethernet technology in high-performance work group environments.

To help users find qualified, cable installers, **MOD-TAP System** has implemented a Certified Installer Program. Installers participating in the program will be trained by MOD-TAP and certified in implementing copper- or fiber-based cabling systems.

MOD-TAP: (508) 772-5630.

Scope Communications, Inc. has introduced FrameScope 802, a pocket-sized network analyzer that captures and analyzes packets on both token-ring and Ethernet local-area networks. The product, which supports all the major wiring types, measures several net parameters, including utilization, traffic breakdowns by station or protocol, as well as errors by station and type.

The 802 supports filtering to monitor traffic from one station or between stations. It can also run echo tests on Novell, Inc. NetWare or Transmission Control Protocol/Internet Protocol nets.

Available now, the 802 costs between \$3,995 and \$5,095, depending on configuration.

Scope: (508) 393-1236.

Hughes LAN Systems, Inc. has rolled out Version 2.2 of its ProLINC multiprotocol connectivity software and Version 1.2 of its ProLINC WINtools for Transmission Control Protocol/Internet Protocol connectivity software running on Windows.

Both packages have been enhanced with support for the current versions of major operating systems, including Windows 3.1 and MS-DOS 6.0.

New NetWare 3.12 to fix bugs in previous version

Latest release to include inherent messaging, Macintosh and VLM support.

BY CARYN GILLOOLY

Provo, Utah

Novell, Inc. last week introduced NetWare 3.12, the newest release of its most popular network operating system.

As expected, 3.12 is primarily a conglomeration of the bug fixes and minor enhancements Novell has issued over NetWare during the past 2 1/2 years since NetWare 3.11 was first introduced.

But NetWare 3.12 also includes some higher end features that will satisfy the growing needs of Novell's mid-level users. For them, NetWare 3.12 narrows the gap between Novell's NetWare 4.X and NetWare 3.X product lines without requiring them to accommodate the 4.X directory service.

"NetWare 3.12 is aimed at work group and departmental users," said Ladd Timpson, product-line manager

for NetWare 3.12. "We introduced 4.01 to address the needs of our corporate customers' networks. This is focused at customers with networks that are usually independent entities and don't need to be centrally managed."

Novell is also hoping NetWare 3.12 will provide enough capabilities at an affordable price to entice its 2.X customers to upgrade to the 3.X platform.

FEATURE PARADE

NetWare 3.12 is the first version of NetWare to include inherent messaging capabilities — something the company has stated that it will add to the entire NetWare line.

Through a Message Handling Service (MHS) NetWare Loadable Module running on the server, NetWare 3.12 users will automatically be able to exchange messages with any other user

See NetWare 3.12, page 24

Beefing up NetWare

New NetWare 3.12 features

Built-in support for Macintosh, including:

- A 5-user NetWare for Macintosh license.
- A set of Macintosh-based utilities that let administrators perform network management functions from a Macintosh.

Built-in MHS, including:

- A basic MHS in the form of an MHS NetWare Loadable Module that will deliver MHS messages to users on a single NetWare 3.12 server.
- A starter E-mail application called FirstMail for DOS and Macintosh users.

New Universal NetWare client, offering:

- Choice of either Virtual Loadable Modules (VLM) or NETX for use on client. VLMs let administrators standardize client software across DOS and Windows desktops; NETX/ODI is the ordinary 3.X client shell.

New version of Btrieve:

- Btrieve 6.1, Novell's flat-file database that now offers enhanced performance and on-line backup capabilities.

CDROM support, including:

- A new CDROM installation option with the complete set of documentation on Novell's new ElectroText electronic format.
- Support for CDROMs as NetWare volumes

Enhanced wide-area connectivity:

- Support for Novell's Packet Burst and Large Internet Packet technologies, providing enhanced connectivity over WAN connections.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: NOVELL, INC., PROVO, UTAH

ADMINISTRATION

Former Novell exec named new UB chief

BY SKIP MACASKILL

Cupertino, Calif.

Ungermann-Bass, Inc.'s new President and Chief Executive Officer Roel Pieper last week outlined the turnaround challenges facing UB, citing a return to financial stability and a top-to-bottom evaluation of all products and partnerships as top priorities.

The 37-year-old Pieper was also named senior vice president of Tandem Computers, Inc., UB's parent company, and he succeeds Ralph Ungermann in the top slot at UB, where Pieper faces a host of challenges.

UB has been losing money for the past six months, with a \$7 million loss recorded for the last quarter. The company, which has traditionally been focused on the high end of the networking market, has failed to tap into the low to mid-range segments where many of its competitors have been garnering market share and profits.

To complicate matters, Tandem has been experiencing its own financial woes, which has limited the backing available to UB. Tandem announced a restructuring plan at the time Ungermann resigned in July, and UB is expected to play a key role in Tandem's efforts to regain momentum,

which puts additional pressure on Pieper.

During the next three months, Pieper will formulate a new business plan for UB — a plan based in large part on information gained from conversations with users. "My highest priority is to get out and talk to our customers to find out what we're doing right and what we're doing wrong," Pieper said in an interview with *Network World*. "Their concerns have to be our concerns if we're



Roel Pieper and James Treybig

going to turn this company around."

Pieper also plans to scrutinize development efforts, marketing programs and sales plans to ensure they are in line with the new business model. He is also planning to take stock of the partnerships that UB has forged

over the last few years as well as the entire product line.

"Right now, UB has garnered a variety of products and relationships. I will take a hard look to see if we need them as they exist today," he said. "I will decide what stays and what goes."

The finances of this company have to be the engine that drives it, and right now, that isn't the case."

Pieper said he was encouraged by what he has seen in his first few weeks at UB, noting that UB's technology portfolio has the items to make the needed entry into the lower end markets as well as forge ahead in some emerging markets such as switching.

"The products that are necessary to serve the new telephone, television and cable networks are going to require the technical and functional perspective that both Tandem and UB have," he said. "Both companies have also somewhat ignored the client/server segment. I need to position the two as key providers of the components, technologies and services needed there."

Part of Pieper's challenge in capturing some of the low-end market share means leveraging the company's relationship with NetWorth, Inc., a hub maker based in Dallas that focuses on the mid-range and low-end segments. UB owns a majority stake in NetWorth.

See UB, page 24

"The finances of this company have to be the engine that drives it, and right now, that isn't the case."

We're talking hot technology here. Very hot. In fact, the IBM hubs offer so many striking features and attractive benefits, they're practically irresistible. Take the 8250 Multiprotocol Intelligent Hubs, for example. For any company trying to integrate a complex combination of local or remote Token-Ring, Ethernet or FDDI LANs, it's sure to be love at first sight.

Hubba

The 8250 hubs are engineered around a unique, feature-rich backplane design offering

Strategic Hub Solutions from IBM

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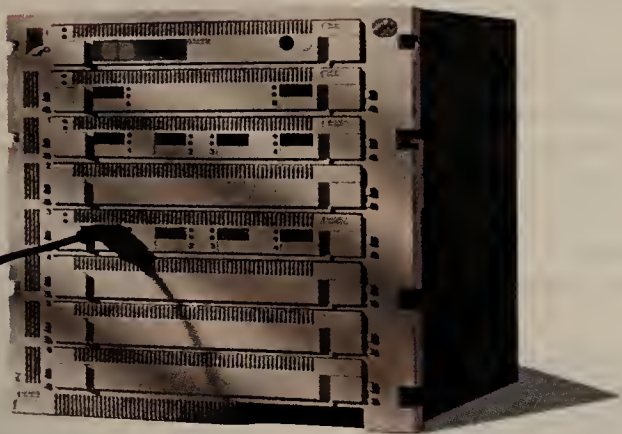


IBM 8230 Controlled Access Unit (connects up to 80 Token-Ring devices at 16Mbps or 4Mbps, flexible lobe attachment modules, automatic recovery)

IBM 8250 Multiprotocol Intelligent Hubs (6-slot/17-slot models, connect a combination of multiple Token-Ring, Ethernet and FDDI networks, slot independence, hot pluggability, port switching, fault tolerance, redundancy and comprehensive management)



IBM 8228 Token-Ring Multistation Access Unit (cost-effective, 8 ports, cascading)

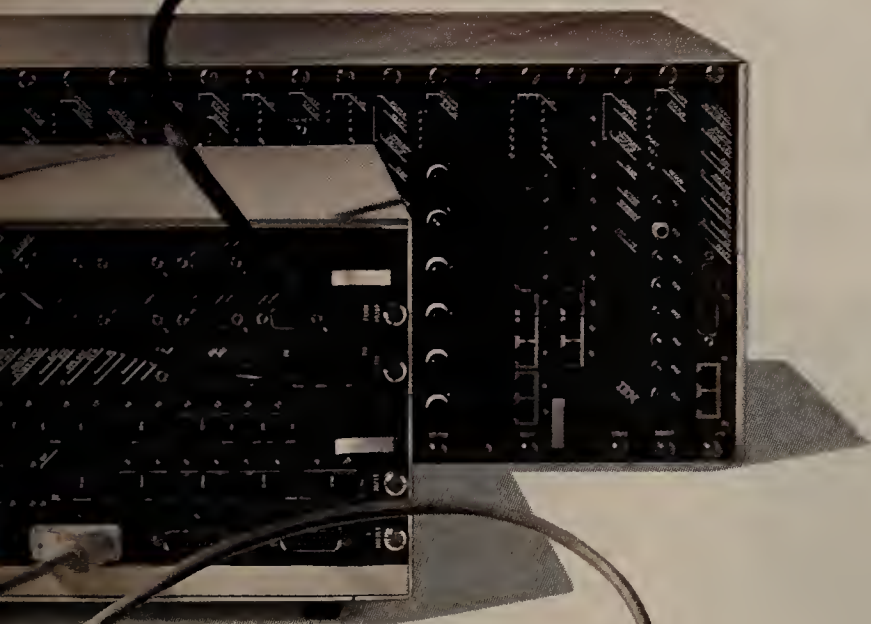


IBM 8240 FDDI Concentrator (links up to 24 users with fiber or copper, hot pluggability)

terms of long-range operational savings. The strategic features of the 8250 hubs mean improved productivity. Fewer trips to the wiring closet. Less downtime. Remote control. Flexibility to grow. And, of course, the kind of reliability and service that only IBM can provide.

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IBM 8222 6-Port 10BaseT Workgroup Hub (AUI port cascades for added connectivity, LED diagnostics, full 802.3 compliance)

IBM

[Making networks work.]

IBM offers 7 new servers

Latest wares feature Pentium, RAID 5 fault tolerance.

BY CHRISTINE BURNS

Somers, N.Y.

IBM this week will beef up its server line by adding seven new machines that feature Pentium processor support, fault-tolerant storage capabilities and optional systems management features.

Three of the five new Personal System/2 95 servers will ship with Pentium processors, while the other two will be powered by Intel

Corp. i486DX processors, as will the two new models in the PS/2 85 server line. All of the i486DX boxes will offer upgrade paths to the Pentium.

By including support for Redundant Array of Inexpensive Disks (RAID) Level 5 on the PS/2 95 server line, IBM moves the fault tolerance storage capabilities previously offered only on its high-end PS/2 195 and 295 servers down to a more affordable platform.

Also being moved down from the high-end servers is optional support for IBM's PS/2 Serverguard systems management product.

PS/2 Serverguard consists of a MicroChannel remote maintenance processor, an integrated Personal Computer Memory Card International Association modem and PS/2 Serverguard, and Maximum Availability and Support System/2 software that together lets users remotely or locally tune, monitor and control large, geographically dispersed networks.

The intelligent processor is installed on the server along with the Serverguard software. See IBM, page 27

UB

Continued from page 21

Pieper's career began 12 years ago at Software AG in Germany, where he served as chief technical officer.

In 1991, he became president and CEO of Unix Systems Laboratories, which was a software unit of AT&T until Novell, Inc. acquired the company in June. After the merger, Pieper became executive vice president at Novell.

While some industry observers have privately questioned the strategy of bringing in an executive who is steeped in Unix experience, Pieper pointed out that he actually had a stronger networking background.

"When I was at Software AG, my lead responsibility was centered on networking," he said. "In fact, making the move to USL was the odd move for me from a technology point of view."

That Unix experience, however, will be tapped by both Tandem and UB, according to Pieper. "Both Tandem and UB will be making a bigger push into the Unix market," he said. "Unix is going to be much more successful than people expect it to be."

For his part, Jim Treybig, president and CEO of Tandem, however, said he firmly believes that Pieper is the person to get UB back on track. "We wanted someone who could take a company with a lot of technological strengths and commercialize them in the market," he said. "Pieper did an outstanding job of that at AT&T and USL, and it will be his job to get both revenue and profitability up at UB." □

NetWare 3.12

Continued from page 21

attached to that server. The MHS support will also let local users exchange facsimiles and use various forms processing and work flow applications that employ MHS as a delivery engine. Previously, MHS was an add-on product to NetWare 3.X.

Novell has also included with NetWare 3.12 a low-end electronic mail application for DOS and Macintosh users called FirstMail. "FirstMail gives users baseline E-mail functionality right out of the box," Timpson said.

Novell has also included in 3.12 a five-user version of NetWare for Macintosh, providing significant cost savings for customers. The former version required customers to pay \$2,995 to add support for 20 Macintosh users. Now, not only is five-user support inherent in the

product, but an additional license to support as many as 200 Macintosh users is available for only \$995.

The Macintosh support will be derived from a new version of NetWare for Macintosh, which was also announced last week. It now includes a new client-based utility, dubbed NetWare Tools, that lets NetWare administrators manage Macintosh network resources from any Macintosh on the net.

For improved wide-area network connectivity, Novell has included in NetWare 3.12 support for its Packet Burst and Large Internet Packet technologies. The former will let customers send data in bursts, improving performance.

Large internet packet support will let customers send data with larger packets rather than requiring them to use the LAN's smallest common denominator packet length. Larger packets will require fewer acknowledgments

at the other end, in turn, speeding transmission.

On the client side, Novell has added support for its Virtual Loadable Module (VLM) architecture. VLM is new redirector technology that provides a standard NetWare interface across all client platforms. The VLM architecture also lets users load more NetWare functionality into high memory, freeing up conventional memory for application support.

Other new features in NetWare 3.12 include a new version of Btrieve, Novell's flat-file database, and CDROM support (see graphic, page 21).

NetWare 3.12 is available now.

A version for five users costs \$1,095; 10 users, \$2,495; 25 users, \$3,695; 50 users, \$4,995; 100 users, \$6,995; and 250 users, \$12,495.

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Firm unveils entry-level RAID software-only product

BY CARYN GILLOOLY

Milpitas, Calif.

Storage Dimensions, Inc. last week introduced LANStor RAIDMaster, a software-only product that provides Novell, Inc. NetWare users with RAID Level 5 fault-tolerant storage capabilities.

Storage Dimensions already sells a Redundant Array of Inexpensive Disks hardware product called LANStor Continua, but it is designed for high-end networks, according to Greg Brashier, director of the company's LANStor business unit.

"LANStor RAIDMaster is an entry-level RAID product," Brashier said. It will appeal to customers looking to link existing Small Computer System Interface (SCSI) drives to form an array or those simply looking for more than disk mirroring and duplexing, he added.

The software lets users group industry-standard SCSI disks into a single array and pro-

vide fault tolerance to the array through various RAID levels, from mirroring to striping to full redundancy, which is provided through a combination of both.

LANStor RAIDMaster provides entry-level users with capabilities associated with higher end products, Brashier said. For example, it supports two hot-spare drives so if one fails, it

will automatically rebuild the data on the hot-spare drive. If this replacement drive is faulty, it can still turn to the other drive.

RAIDMaster also incorporates a utility called Pre-Fix that monitors the readability of disk-drive sectors. If data is discovered on a marginal or failing sector, the Pre-Fix utility reassigns that data to a healthy sector and closes off the failing sector.

Finally, Storage Dimensions has incorporated its own LANStor Plus and LANStor DiskAlert storage management software into LANStor RAIDMaster. LANStor Plus monitors SCSI error codes and if a problem is detected,

translates that code into an understandable error message and passes it to DiskAlert. With LANStor DiskAlert, error messages — including the nature, location, time and date of a problem — can be forwarded to any prespecified workstation or to a pager.

LANStor RAIDMaster runs on NetWare 3.11 servers. The software can support as many as four disk controllers and from three to 28 SCSI disk drives. The software will be available next month in two configurations, either bundled with a host adapter for \$995 or as a software-only package for \$595.

©Storage Dimensions: (408) 954-0710.

Eagle rolls out lower cost E-net NIC line

BY SKIP MACASKILL

San Jose, Calif.

Eagle Technology, Inc. this week is expected to roll out a lower end version of its existing Ethernet network interface card (NIC) line geared to users who are primarily motivated by price.

The new adapters include 16-bit Industry Standard Architecture (ISA) and 32-bit Extended ISA (EISA) models that offer users a lower entry price than the company's high-end Novell, Inc.-compatible "Red Box" NICs.

"Basically, the Eagle line has been tested and registered under Novell's 'Yes' program, its first level of certification, while the NE2000 family has received Novell's third and highest level of certification," said Dave De Puy, director of product development at Eagle. "Users can still expect the same level of performance and service and support with the new line."

The EP2000Tplus is a 16-bit ISA adapter that offers 10Base-T connectivity for IBM Personal Computers, XT's and AT's. The EP2000plus offers both 10Base-T and coaxial cable connections. Both cards are software-configurable and offer drivers for Novell's NetWare as well as Microsoft Corp.'s Network Driver Interface Specification (NDIS), the first time the company has offered that kind of

See Eagle, page 27

Ethernet update

55%

1991

In 1992, Ethernet adapter sales continued to outpace other PC network interfaces, according to International Data Corp., a research firm based in Framingham, Mass. In fact, worldwide Ethernet card sales increased from 55% of total sales in 1991 to 67% in 1992.

67%

1992

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by Mark Gibbs

People shouldn't compute in glasshouses

We all know mainframes will never die.

All the talk in the '80s about closing up the com-

puter room and moving computing out into the organization was, to a great extent, wishful thinking.

There are many large-scale data processing

tasks that will be best suited for mainframes for some time to come.

Like zombies in B-rated movies, you can take potshots at them, but they still keep right on stomping along.

But something that should die is the concept of the glasshouse: the idea of centralizing valuable resources where management can exercise total control.

Local-area networks and distributed processing were supposed to do away with the principle of the glasshouse. Data and its derivative — information — was to be distributed around the organization.

But in our brave new world of LANs and downsizing, I think we're kidding ourselves in thinking that the way we control distributed computing today is really conceptually different from mainframe philosophies. I also think that we're wasting efforts and sacrificing efficiency because of this.

Oh sure, there are some big differences between the systems. We have some hot new technologies that are different from those we use on mainframes.

Things like client/server computing, networked object-oriented systems, remote procedure calls and all of the other magic incantations of networks. But we still centralize explicitly and implicitly.

The only thing that we're distributing is processing, and while this is a huge leap in systems architecture, the glasshouse, rather than becoming obsolete, is effectively still here. The concept of centralizing data — and along with it, control and management of that data — is what a file server is all about.

We even centralize other services that distribute data and manipulate data — server-based processes such as SQL engines and electronic mail services. Every server is, in effect, a miniature glasshouse.

This is because the stuff that we consider important in our organizations is the data on the file servers. So we worry about file server security. We forget, to a great extent, workstation security.

The problem is that we're still focusing on controlling the place where we think our organization's data is located.

What we often forget is that without context, data is useless. We have to give data meaning and purpose (Professor Peter Drucker's phrase) for it to be information, the stuff we really use. And much of the context for that transformation is out on the network workstations.

The file server holds the basic stuff, but the magic comes from where the users are. They know the relationships and details that make business possible, and yet our software, on the whole, has no way to trap that knowledge. Then when employees leave, their experience leaves with them. When their workstations fail, they have to rebuild their working environment that gives them access to their view of the data — their information.

What we need is to stop thinking of the file servers as if they are the network, secure the workstations and ensure that we can trap the magic that the users create to transform data. We need to get rid of the glasshouse mentality — it's just holding us back from real efficiency and effectiveness.



♦ Mark Gibbs is a consultant and writer based in Ventura, Calif. If you'd like to comment, E-mail him on CompuServe (75600,1002) or on the Internet at mgibbs@rain.org.

Comments

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IBM

Continued from page 24

ware, which monitors internal server temperatures, voltage and performance and allows for reboot and power on/off control. The MASS/2 software and modem let users remotely tune and change the server characteristics.

CREAM OF THE CROP

Brian Sanborn, PS/2 Server 85/95 product manager, said the highest end server being introduced is the PS/2 95 Array 566. "This is our bells and whistles product," Sanborn said. "The PS/2 95 Array 566 encapsulates all the best features of the other new servers into one machine."

The box comes with a single 66-MHz Pentium processor with 256K bytes of dual port

to 40M byte/sec.

IBM has also included its new Synchro-Stream controller technology in the servers, which provides multiple parallel paths between the processor, memory and bus master adapters, preventing data bottlenecks.

In terms of fault tolerance, the server supports as many as seven 540M-byte or 1G-byte hard disks using RAID Level 5 technology. RAID 5 provides a high level of fault tolerance because data is striped across all the disks in the array so that data can be reconstructed if one disk fails. A dedicated on-board Intel 960 RISC processor with a 4M-byte cache handles

the task of writing data across the backup disks to avoid taxing the central processor.

The PS/2 95 Array 560 contains most of the functionality of its high-end cousin, except it has a 60-MHz Pentium processor and is shipped with either three 540M-byte or three 1G-byte hard disk drives.

The PS/2 95 560 also uses the 60-MHz Pentium processor but ships with only one 1G-byte hard drive and does not support RAID 5 fault tolerance. The PS/2 95 Array 466 and the PS/2 95 466 both have an i486DX2 processor that can be upgraded to support the Pentium chip, but the first offers RAID 5 support

whereas the latter does not.

The two new PS/2 85 servers will replace IBM's current entry-level offering called Server 85. The PS/2 85 466 has a 66-MHz i486DX2 processor with 256K bytes of Level2 writeback cache, while the PS/2 85 433 is powered by a 33-MHz i486DX chip with 128K bytes of cache. Both have 8M byte of ECC memory and can be upgraded to support the Pentium chip.

The price of the PS/2 Server 95s will start at \$11,000, while the price of the PS/2 85s will begin at \$5,000.

©IBM: (800) 426-2468.

New IBM PS/2 servers		
Server	Features	Availability
Server 95 Array 566	Pentium 66-MHz processor, 3 1G-byte hard disk drives, RAID 5 array	Nov. 12
Server 95 Array 560	Pentium 60-MHz processor, 3 540M-byte or 3 1G-byte hard drives, RAID 5 array	Nov. 12
Server 95 560	Pentium 60-MHz processor, 1 1G-byte hard drive	Sept. 30
Server 95 Array 466	i486DX2 66-MHz processor, 3 540M-byte or 3 1G-byte hard drives, RAID 5 array	Nov. 12
Server 95 466	i486DX 66-MHz processor, 1 540M-byte or 1 1G-byte hard drive	Oct. 22
Server 85 466	i486DX2 66-MHz processor, 1 540M-byte or 1 1G-byte hard drive, Pentium-upgradable	Nov. 30
Server 85 433	i486DX 33-MHz processor, 1 540M-byte or 1 1G-byte hard drive, Pentium-upgradable	Nov. 30

SOURCE: IBM PC CO., SOMERS, N.Y.
GRAPHIC BY SUSAN J. CHAMPENY

Level2 cache and three 1G-byte hard disk drives. It also comes with 16M bytes of Error Checking and Correcting (ECC) memory, expandable to a maximum of 256M bytes and dual 32-bit Small Computer System Interface (SCSI-2) disk channels.

The PS/2 95 Array 566 supports data streaming that allows data transfer rates of up

Eagle

Continued from page 25

driver support.

Available now, the EP2000Tplus and EP2000plus cost \$89 and \$99, respectively.

The new EP3210T is a 32-bit EISA card that offers 10Base-T connectivity to 486-based client workstations. The EP3210 provides both 10Base-T and coaxial cable connections. Both cards offer 32K bytes of random-access memory and support NetWare and NDIS drivers. Available now, the EP3210T costs \$189, while the EP3210 comes is priced at \$199.

The firm will also roll out a new card in its high-end Red Box line. The Novell NE3210 is a 32-bit EISA adapter designed for 486-based clients or servers with light to medium loads. The combination card provides 10Base-T, BNC and attachment unit interface connections. Available now, it costs \$234.

Eagle will also announce plans to expand its product base to other technologies, including Fiber Distributed Data Interface, wide-area net interfaces and Personal Computer Memory Card Interface Association-based cards.

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Numbering plan means net manager pains

BY BILL BURCH

Washington, D.C.

The launch of the new North American Numbering Plan next month in California promises a bounty of new phone numbers for users and service providers, but for network managers, the new plan will also mean expensive PBX upgrades and the risk of unauthorized toll calls.

Bell Communications Research has long planned to switch to the new numbering plan in 1995, but to prepare for that change, a number of states will adopt new dialing schemes earlier. Following California's October launch, Indiana will migrate to the new dialing plan Dec. 1.

With its new numbering plan, Bellcore will alter the area code format to allow an area code's second digit to range from 0 to 9, rather than the 0 or 1 used today. To implement the plan, local exchange carriers can choose between seven-digit and 11-digit dialing.

Under seven-digit dialing, a local exchange carrier allows customers to place any call within an area code by dialing only seven digits, eliminating 1-plus dialing for toll calls within an area code. Eleven digits — 1 plus a phone number with an area code — are used to call outside an area code. Seven-digit dialing will be used throughout California after its switch next month.

For 11-digit dialing, a caller uses an 11-digit number for toll calls within an area code, as well as for all calls to other area codes. Launching the plan will require network managers to upgrade their private branch exchanges to handle the new dialing schemes.

Unfortunately, California's early launch of the new dialing plan has caught some PBX manufacturers unprepared. AT&T has most of its upgrades ready but will not have gear for its Dimension and System 85 switches until January.

For Northern Telecom users, most of its Meridian switches can be reprogrammed by technicians without an upgrade. Users of old equipment should upgrade before reprogramming for the new numbering plan, according to Northern Telecom staff. The company plans to have a new release available in November for its Option 11 users, and for others, new software will be out in January.

Once the upgrades are ready, users may have to make changes in both software and hardware. AT&T users are looking at about \$1,500 to upgrade a Definity G1 and between \$4,000 to \$5,000 for a System 75, according to Charlie Fallon, AT&T's product manager for the Definity PBX line.

Many PBXs use the 1-plus prefix to block toll calls from some phones. With seven-digit dialing, that prefix will disappear, opening up some customers' nets to unauthorized toll calls (NW, Aug. 9, page 29).

To solve the problem, PBXs must keep a database of all toll-free exchanges, a feat beyond the current versions of some manufacturers' PBXs. Managers must also track future changes in toll calling areas. ■

WilTel's WilPak service at a glance

Introduced:
March 1991

Availability:
From 96 points of presence

Customers include:

Convex Computer Corp.

Konica Business Machines USA, Inc.

Sequent Computer Systems, Inc.

Number of users:
Over 100 — more than any other frame relay provider

SOURCE: WILTEL, TULSA, OKLA.
GRAPHIC BY TERRI MITCHELL

WilTel outlines its frame relay net management service scheme

SNMP-based offering lets users receive alarms, view data.

BY BOB WALLACE

Tulsa, Okla.

WilTel last week detailed plans for a network management service that will enable its frame relay users to receive alarms and access service usage and performance data from their existing SNMP-based management systems.

WilTel's new WilView/SNMP service enables WilPak frame relay users to obtain critical service data from any Simple Network Management Protocol-based net management platform, including IBM's NetView/6000, Hewlett-Packard Co.'s Open View and SunConnect's SunNet Manager. No special software is required to use the service.

The offering will use the Frame Relay Service Management Information Base (MIB), which is close to being standardized by the Frame Relay Forum and

the Internet Engineering Task Force (IETF).

"We are well aware that a number of vendors already offer SNMP-based network management systems, so we chose to focus on developing a service based on this Management Information Base," said Russ McGuire, product manager for WilTel's net management services. "Users need more than hard-copy reports to get a handle on their frame relay networks."

Analysts agreed, noting that this WilTel service offers more capabilities than other frame relay providers' services. "Many carriers only offer reports that cover operations by day, week or more, which isn't enough for users who want more timely information on their frame relay networks," said Rick Malone, a principal at Vertical Systems Group, a Dedham, Mass., firm that tracks frame relay usage.

See WilTel, page 35

Ameritech Cellular launches first data modem-pool service

BY ELLEN MESSMER

Hoffman Estates, Ill.

Ameritech Cellular Services has launched a new service aimed at helping users inexpensively deal with incompatibility problems caused by the lack of standards for cellular data modems.

Called Wireless Field Express, the service lets cellular facsimile and data calls using proprietary modem standards terminate at a modem pool in the Ameritech network. A standard wireline modem is then used to deliver the fax or data to a user's host site. That eliminates the need to ensure the identical proprietary cellular data modem is installed at the host site for each type of modem in use by mobile users.

Mobile computers outfitted with cellular

data modems handle the job of error checking and dynamic speed adjustment for data sent over cellular airwaves. But with no cellular modem standard, establishing the connection is a hit-or-miss situation, said Greg Oslan, director of wireless data at Ameritech wireless services.

"Our customers told us that every different [cellular data] modem requires them to put in a different one [at the host site]," he said. "You need the same protocol on both ends."

Oslan said there are about a dozen different cellular modems on the market at this time, with most of them adhering to either the Micro-

com, Inc. Network Protocol 10 (MNP10) or AT&T Paradyne's Enhanced Cellular Throughput (ECT) standards for data compression and error correction.

However, there is not even compatibility among different brands of either MNP10 or ECT equipment since modem vendors

See Ameritech, page 35

Ameritech wants your data

Company and product	Features
AT&T Paradyne Keep in Touch Pad	14.4K bit/sec data, 9.6K bit/sec fax PCMCIA card
Compaq Computer Corp. SpeedPak 144	14.4K bit/sec data, 9.6K bit/sec fax external modem
Microcom, Inc. 4232bis	14.4K bit/sec data, 9.6K bit/sec fax external modem
Motorola, Inc. CTM Modem	2,400 bit/sec data, specific to fleet management

Ameritech Cellular Services converts 4 proprietary cellular data modem protocols into standard wireline formats, eliminating the need for users to employ cellular data modems at host sites. The service is free to Ameritech cellular service users.

PCMCIA = Personal Computer Memory Card International Association
GRAPHIC BY TERRI MITCHELL SOURCE: AMERITECH, CHICAGO

BRIEFS

AT&T last week announced extended contract terms for users that buy dedicated access through the carrier's Access Value Plan (AVP). With AVP, users can receive discounts of up to 24% if they use AT&T to buy T-1 access services from local exchange carriers.

In the past, users could sign one-, two-, three-, four- and five-year contracts but not intermediate-length deals.

Now users can sign on for

12 to 23 months and get the original one-year discount of 5%, 24 to 35 months at 10%, 36 to 47 months at 20% or 48 to 59 months at 22%. The five-year term plan remains the same and carries a 24% discount.

The ATM Forum's Services Aspects & Applications group is at work on a local-area network emulation technique whereby packets are encapsulated in Asynchronous Transfer Mode (ATM) cells at the media

access control link layer instead of at the Internet Protocol level, which would make ATM protocol-transparent. Work on this effort could be done by the third quarter of 1994.

The ATM Forum is also working on specifications that define how frame relay traffic is supported over ATM and one that delineates Switched Multimegabit Data Service-to-ATM interworking.

AT&T last week said it has selected Electronic Book Technologies' electronic delivery

system to provide product documentation manuals on CDROM to users of its Definity Generic 3 Version 2 (G3V2) line of digital private branch exchanges.

AT&T said the initial offering will include the Definity G3V2 System Description, Feature Description and Implementation manuals, which will be shipped free on CDROM with each new switch order or upgrade before March 1. After that, one or more copies will cost \$200 each.

AT&T: (800) 432-6600.

by David Rohde

Frame relay now available end to end

Ever since its introduction, frame relay has typically been a cheaper alternative to using end-to-end private lines for transmitting data, but it required dedicated access on each end. But that's changed with the recent introduction of frame relay access to the long-distance carriers' networks, which has driven

overall local frame relay costs down.

Take the case of Southwestern Bell Corp., which joins US West, Inc. as the first of the regional Bell holding companies to introduce frame relay access. In June, the company received Federal Communications Commission approval to allow interconnection of its frame relay service to long-distance company networks and then promptly dropped its prices to encourage usage.

For example, a Southwestern Bell 1.5M bit/sec line for interstate frame relay access now costs \$575 per site. That's down from \$850, the price Southwestern Bell still charges

for strictly intra-local access and transport area frame relay service.

You also need logical links, or permanent virtual circuits (PVC), to connect locations on your network. Those prices also dropped — from \$160 per month to only \$50 for a 1.5M bit/sec link. With these numbers, frame relay is becoming even more attractive to Southwestern Bell customers.

Suppose you have six sites in Texas. To calculate the logical links needed, divide the number of sites (six) by two, subtract 0.5 and multiply by the number of sites (six). The result: You need 15 PVCs. At \$50 per PVC, the cost to establish logical links connecting each site with every site is \$750.

The cost for a 1.5M bit/sec frame relay-based access link is \$575 per site, or \$3,450. Add that to the \$750 PVC cost, and you get a monthly outlay of \$4,200. That's 45% less than what you would have paid before the price decreases, according to Southwestern Bell. But the real kicker is that the same setup with standard T-1 access from Southwestern Bell would cost \$5,615. So frame relay is clearly a better deal — at least on the access end.

The cost of the long-distance carriers' frame relay service is more difficult to determine. Although the FCC requires local exchange carriers to file tariffs for frame relay access, the interexchange carriers don't have to file tariffs for the inter-local access and transport area portion of frame relay service because it's considered an enhanced service. You can get an idea of inter-LATA costs from the nontariff price sheet published by MCI Communications Corp., which details three types of PVC rate options:

■ **Fixed committed information rate (CIR) PVCs** — priced on a flat monthly rate based on mileage bands and bandwidth. For example, a PVC of 500 to 750 miles at 384K bit/sec costs \$609 per month.

■ **Usage CIR PVCs** — priced on the amount of data transmitted.

■ **Zero CIR PVCs** — based strictly on usage.

But there's a catch: Right now the MCI price sheet only reflects costs based on dedicated access, not frame relay access. Eventually, MCI and the other carriers may publish PVC prices based on frame relay access, and they may be higher than the prices based on dedicated access. That's because going from frame relay access to MCI's PVCs is analogous to an off-net to on-net call on MCI's Virtual Network (Vnet), while going from dedicated access to MCI's PVCs is like a less expensive on-net to on-net call on Vnet.

Your best bet for now: If you're using a long-distance carrier's frame relay service and you have dedicated access, you want to check out frame relay access — it's probably a better deal. In contrast, if you're using dedicated access but combining both data and voice, you may already have the best deal you can get.



◆ Rohde is associate publisher with the Center for Communications Management Information in Rockville, Md., a provider of rate and tariff information. He can be reached at (301) 816-8950, Ext. 292.

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The two types of networking shows.

If you've got the time, you ought to be at both ComNet and one of the shows focused only on local area networks. If not, there's an easy way to decide which type is for you.

The LAN-based shows concentrate on technical "interoperability" issues. Important issues, to be sure, but not the big picture.

ComNet is the only global networking show. It's the conference and exposition focused on the enterprise internetwork. It not only covers LANs but also the latest technologies like ATM, Frame Relay, SMDS, FDDI, and mobile data communications that are shaping the new enterprise.

ComNet also deals with real-world solutions like imaging, voice, data, workgroup and database applications that are driving networking technology.

Produced by IDG World Expo.

Furthermore, ComNet is produced and managed by IDG World Expo, the worldwide leader in professional conferences and expositions for the information technology industry ... including ComNet Prague, EuroComNet and ComNet Korea. It is part of International Data Group (IDG), the leading global provider of information services on information technology.

ComNet is officially sponsored by *Network World* and *Computerworld*. IDG World Expo also brings the full support of other IDG publications and companies including *Federal Computer Week*, *InfoWorld*, *CIO*, and International Data Corp. in providing exhibitors with the highest quality attendee promotion.

If your company is global, or thinking of going global, then ComNet '94 ought to be in your tradeshow plans. It makes good sense, since 45% of the people who went to ComNet last year already have multinational networks.

ComNet is a show for decision makers.

3Com's John Covert said, "What we're seeing are the principal network people who are really on the firing line,

or the people who have to make the decisions for next-generation technology."

Jim Warner, marketing director for the Network Management Forum and frequent ComNet participant said, "At ComNet the quality of attendee is very high. The collective purchasing power of ComNet's enterprise network management audience is unsurpassed."

According to the latest independent audience surveys of ComNet and Interop, 47% of ComNet attendees are from companies that spent \$1 million or more on networking equipment in 1992, vs. 36% for Interop Fall.

First show of the year.

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Fitting SMDS to support today's user networks

Second in a two-part series.

By TOM NOLLE

Voorhees, N.J.

Compatibility with future directions doesn't mean much if a technology does not fit into networks of the present.

Many users think Switched Multimegabit Data Service (SMDS) is more difficult to apply to their current nets than other technologies such as frame relay. Some believe that because their computer vendor doesn't provide an SMDS interface, they cannot use the service.

Neither view is correct.

Users planning for SMDS should begin with the litany, "SMDS is a LAN." Most of the major router vendors provide an SMDS interface option using something called the Data Exchange Interface. This interface lets existing routers send data messages to a specially designed data service unit/channel service unit (DSU/CSU), where they are converted to the SMDS data structure. The process adds

bone. Many users and some analysts have condemned SMDS because there are no interexchange SMDS services offered. How can the user build an enterprise net with a technology that only works at the metropolitan level?

SMDS does, in fact, define interexchange service, but no carriers have stepped forward to provide it. Is this really a problem though?

FDDI users would not (and do not) insist on "interexchange FDDI" to build internetworks. Two years after frame relay was introduced, there are still no local exchange-to-interexchange frame relay connections.

Any router connected to any wide-area networking service — such as frame relay and leased lines — can link an SMDS net in one city to similar SMDS complexes in other cities. This mixed-service internetworking works with any carrier service supported by a router and with any LAN protocol.

How about Systems Network Architecture? IBM doesn't offer a single device with an

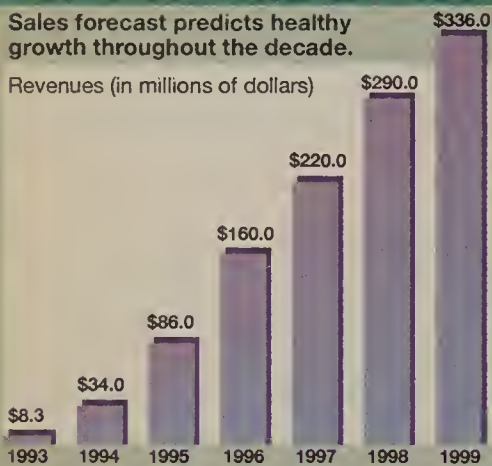
SMDS interface, but any router set capable of routing SNA protocols and supporting an SMDS interface can be used to build an SNA-compatible SMDS internet. Users can select routers based on vendors' ability to support SNA routing and the sensitivity of their SNA applications to delay and response times.

Although IBM's 6611 does not offer direct SMDS support, it could still be used in an internet employing SMDS, connecting to SMDS services through another router that does support SMDS. If IBM, as expected, announces SMDS support on the 6611 late in the year, this indirect connection will no longer be required.

SMDS on the rise

Sales forecast predicts healthy growth throughout the decade.

Revenues (in millions of dollars)



Revenues from interexchange carriers' Switched Multimegabit Data Service (SMDS) sales are not expected to exceed 10% of annual revenue figures listed above.

Figures based on a survey of 267 users at companies with at least 550 employees.

GRAPHIC BY TERRI MITCHELL

SOURCE: CIMI CORP., VOORHEES, N.J.

between \$2,500 and \$3,500 to the base cost of the DSU/CSU. Routers so equipped can use SMDS as a backbone technology just as they could use Fiber Distributed Data Interface.

A Novell, Inc. user employs SMDS by attaching routers that can support Novell NetWare's Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX) protocol to an SMDS network in order to create a local-area network internet on a metropolitan scale.

For example, if a chain of retail outlets had NetWare LANs, SMDS could link them into a common internet via a router that supported both IPX/SPX and SMDS. In fact, only the routers that connected to an SMDS link would have to be provided with an SMDS interface; other routers or bridges would be unaffected.

This easy application of SMDS arises out of the LAN-like nature of the service. Because it supports the same multicasting, connectionless service as a LAN, it can be applied where any LAN backbone technology can be applied.

Routers or bridges can support SMDS simply by supporting the interface, the way they would support any new LAN technology, such as FDDI. Users can plan SMDS networks the way they would plan FDDI backbones, right down to the point of setting up routing tables.

SMDS can be internetworked through wide-area services like any other LAN back-



Since "SMDS is a LAN," can we attach LAN servers directly to it? In theory, yes. In practice, direct computer attachment to SMDS is still difficult. Sun Microsystems, Inc., a major workstation vendor, has demonstrated direct SMDS access, but carriers have not reported installations of this type.

All of the early SMDS users have already attached their LAN servers to premises LANs. Moving them to attach to an SMDS link offers only the modest benefit of keeping incoming traffic destined for the SMDS-attached server off the premises LAN.

On the other hand, a server attached to an

SMDS link could be used to provide information services for a broad user community. Bell Atlantic Corp. has employed SMDS to provide Internet access to MORENET, a Morris County, N.J., library network.

Using SMDS to access the Internet will probably assure enough SMDS revenues to keep the service growing, if slowly, through the decade. By the year 2000, SMDS could earn about \$300 million per year in service revenues, not riches but certainly not rags, either.

The year 2000 will probably be SMDS' golden age. Beyond that, there is little chance it will survive as an independent service.

The correspondence between SMDS and ATM's connectionless Class D services has already been noted (NW, Sept. 13, page 29) and at least one RBHC — Nynex Corp. — is already planning to deploy SMDS as just one of its ATM-based services. Connectionless services delivered in the more flexible context of ATM would be just as effective in the applications cited above as SMDS would be, and it could be augmented by other services such as voice and video where required.

SMDS assured itself a place in the future through its influence on the adaptation layer standards for ATM. The fact that ATM planners

have included SMDS-like services within ATM is proof that no one, even rival planners, question the value of what SMDS could do for communications users.

With better, broader support from vendors and carriers, SMDS might have advanced the deployment of what is truly a broadband ATM service subset by several years. SMDS did not get that support, and most users will not get SMDS.

It may be their loss.

♦ Nolle is president of CIMI Corp., a Voorhees, N.J., consulting, research and education firm.

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Ameritech

Continued from page 29

implement both these protocols differently. Ameritech's Wireless Field Express service renders the modem interoperability issue moot. Users access the Ameritech service by simply dialing "*" plus a four-digit prefix in front of the host system number being called, Oslan said. "That establishes the wireless connection error-free. Then our network calls up their host to establish the landline call." The service comes at no additional charge to Ameritech cellular customers.

Initially, Ameritech's Wireless Field Service will support the Microcom 4232bis modem and a special type of fleet management modem by Motorola, Inc. (see chart, page 29).

The MNP10-based Compaq Computer Corp. SpeedPak will be added to the modem-pool service by the end of September. ■

WilTel

Continued from page 29

Companies that want to use WilView/SNMP will need a permanent virtual circuit (PVC) to access the appropriate host computers in WilTel's net. The carrier will not charge firms for the PVC.

Malone said WilTel has more frame relay users than any one of the Big Three (see graphic, page 29).

WilPak users will be able to receive alarms generated by failed switch ports and PVCs in about one minute. Furthermore, net managers will receive an alert whenever a requested change in the committed information rate (CIR) is made. WilTel's frame relay customers will also be able to access tables that show usage by port and PVC, McGuire said.

Network managers will be able to access frame relay performance data, which shows how many frame relay frames were marked discard-eligible, as well as the number of frames that were discarded, McGuire said.

All of these capabilities are supported by the Frame Relay Forum's MIB, but WilTel has also decided to support a feature that McGuire calls community stringing, which enables WilPak users to view performance and service usage information that is up to 30 days old.

WilPak users applauded news of the service. "The only thing we can do today is call and ask them to print historical net statistics and send them to us," said Jim Fay, manager of strategic technology for Private Mortgage Insurance Corp., an early WilTel frame relay user. "With the [new] system, we'd be able to get alarms and view service statistics."

Pricing for WilView/SNMP is not final.

©WilTel: (918) 588-3210.

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CLIENT/SERVER APPLICATIONS

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How E-mail packages rate

Company and E-mail package	Value for money	Message routing	Directory facilities	Calendar	Network administration	User interface
Fischer International Systems Corp.'s Electronic Mail Communication Center/Totally Automated Office	3.63	3.70	3.73	3.60	3.00	3.46
H&W Computer Systems, Inc.'s SYSM	3.86	3.83	3.65	3.78	3.05	3.14
IBM's OfficeVision/MVS	2.90	3.56	3.22	3.03	2.44	2.81
IBM's OfficeVision/VM	3.31	3.63	3.45	2.19	3.09	3.48
IBM's PROFS	2.92	3.55	3.08	3.69	2.54	2.77
Lotus Development Corp.'s cc:Mail	3.57	3.63	3.45	2.19	3.09	3.48
Microsoft Corp.'s Microsoft Mail	3.55	3.54	3.57	2.46	2.96	3.93
Verimotion, Inc.'s Memo	4.16	4.05	4.05	3.57	3.52	3.76

User ratings of E-mail packages on a scale of 1 (poor) to 5 (excellent).

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: XEPHON PLC, NEWBURY, ENGLAND

Bachman to place bid for new unit

BY PETER LISKER

Burlington, Mass.

Bachman Information Systems, Inc.'s recent bid to acquire Cooperative Solutions, Inc. promises to result in an interesting new company.

For the client/server and computer-aided software engineering (CASE) user, the joining of the companies represents the creation of a new breed of vendor that hopes to provide a soup-to-nuts approach to application development.

Bachman offers an integrated line of CASE and reengineering tools that use a model-driven approach to application development. With this method, customers create a model of their application and processing requirements and then use the Bachman products to refine the model and generate the code.

Cooperative Solutions brings its expertise in client/server development tools to the table. The company was an early proponent of client/server architecture for the current wave of interest in downsizing and migration to open systems applications.

The acquisition of Cooperative Solutions is meant to move Bachman, an established presence in the database world, squarely into the client/server arena.

"The advantage of our acquisition of Cooperative

Solutions to our customers is they can now utilize the experience Bachman has in reengineering mainframe systems with the vision of Cooperative's client/server technology," said Peter Boni, president and chief executive officer of Bachman. "We will continue to support both families of products and build our consulting services to offer a single source of expertise for application development and deployment."

Bachman was

founded by Charlie Bachman, the holder of numerous U.S. and foreign patents relating to database technology and the developer of the CODASYL database system. The company has been a pioneer in utilizing CASE and modeling techniques to meet the critical need of lowering development costs for new applications. Bachman targets the top 1,000 U.S. companies and foreign companies that use IBM systems.

Cooperative Solutions has long attracted attention, due in part to the fact that it has raised a total of \$29 million in venture capital. The company is widely thought to have been ahead of its time in concentrating on client/server.

Bachman hopes to bring a higher level of marketing expertise to the Ellipse products and to push the fact that managers seeking to implement distributed processing systems are concerned with maintaining

See Bachman, page 38

The acquisition of Cooperative Solutions is meant to move Bachman squarely into the client/server arena.

Host-based E-mail proving a good value

BY BOB BROWN

Local-area network-based electronic mail systems offer certain advantages over host-based E-mail systems, but lower cost is not necessarily one of them.

The initial purchase price of LAN-based mail systems may be attractive compared to the price of host systems, but LAN E-mail systems pack unforeseen management and maintenance costs and are

simply not cost-effective in environments with many terminals.

LAN mail vendors have been especially aggressive of late in trying to woo users off IBM host-based Professional Office System (PROFS) E-mail systems, which IBM no longer supports, but few users could afford to swap out terminals and install personal computers and LANs to accommodate the change.

See E-mail, page 38

The Almighty



BRIEFS

Tandem Computers, Inc. and The Boston Software Works, Inc. (BSW) have signed an agreement that will enable Tandem to offer BSW's messaging integration products on the Tandem NonStop Himalaya server family.

The new products form the basis for Tandem's Message Integrator offerings, which are a set of fault-tolerant, standards-based electronic mail integration products that combines BSW's InterOffice Message Exchange with Tandem processors in order to provide messaging interoperability and directory synchronization between multiple E-mail systems.

The Message Integrator supports interoperability between major E-mail systems, including IBM's OfficeVision/VM, IBM's OfficeVision/400, Digital Equipment Corp.'s All-In-1, Hewlett-Packard Co.'s DeskManager, Microsoft Corp.'s Microsoft Mail, Lotus Development Corp.'s cc:Mail, Novell, Inc.'s Message Handling Service (MHS) and Unix Mail.

Information Builders, Inc. (IBI), a New York middleware vendor, last week announced Virtual Office, a consulting service designed to provide users of desktop tools and applications with access to enterprise server-based data resources.

IBI consultants will use Windows-based software to give users a common interface to various desktop tools and applications, such as Microsoft Corp.'s Word and PowerSoft Corp.'s PowerBuilder, that will have access to server-based data via IBI's Enterprise Data Access/SQL middleware offering.

Virtual Office, which will integrate as many as five desktop applications on a workstation, is available now for \$27,500.

IBI: (212) 736-4433.

Fischer International Systems Corp. has announced that mainframe users of EMC²/TAO, a multi-platform mail and scheduling product, can now connect directly to mainframe EMC²/TAO database

See Briefs, page 38

Vendors look to objects to integrate apps

BY WAYNE ECKERSON

Microsoft Corp.'s Object Linking and Embedding (OLE) technology promises to integrate Windows applications across networks, but users who cannot wait for distributed OLE to become a reality may find at least a partial solution from rival Lotus Development Corp.

OLE functionality is already available today, but is limited to integrating applications on a single machine. Distributed OLE will enable users to embed or retrieve objects in Windows applications running on different processors throughout a network.

For example, in the future OLE could automatically update a spreadsheet on a user's workstation whenever specified fields in a remote database change. Or OLE could enable spreadsheet users to easily offload complex calculations to more powerful workstations elsewhere on the network.

However, distributed OLE functionality will not materialize for another year or two when Microsoft is expected to release its much ballyhooed

object-oriented operating system called Cairo. But users can get a glimpse of Cairo's distributed object capabilities in OLE 2.0, which Microsoft launched earlier this year.

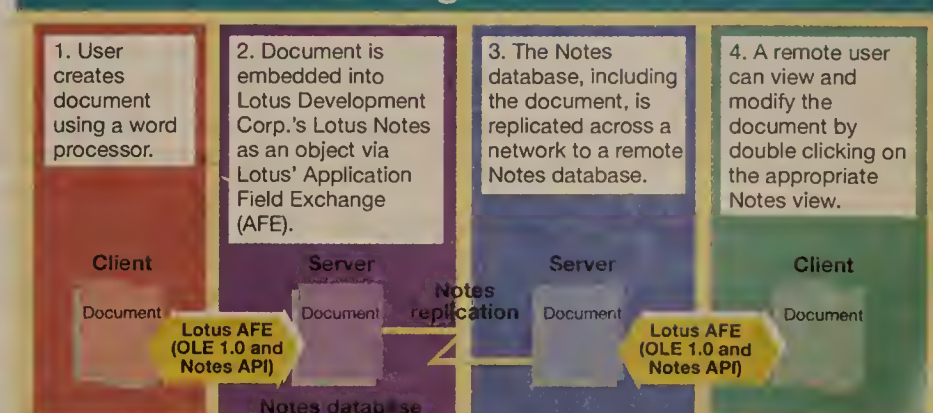
OLE 2.0, which Microsoft officials have called its most significant technology to be announced in 1993 after Windows NT, contains an object model upon which Cairo is being built, according to David Seres, Microsoft OLE 2.0 product manager. The first release of Cairo, which will ship sometime next year, will likely provide basic distributed OLE capabilities, he said.

OLE 2.0, which will be embedded within new releases of Microsoft desktop applications that are due out this fall, allows users to create compound documents from multiple applications running on a single processor.

For example, users can click on a spreadsheet object or file within a word processing application to activate a spreadsheet program. This would enable

See Vendors, page 38

Distributing OLE via Notes



GRAPHIC BY TERRI MITCHELL

API = Application program interface
OLE = Object Linking and Embedding

SOURCE: NETWORK WORLD

E-mail

Continued from page 37

As a result, many users are moving off homegrown and antiquated host-based systems to newfangled host mail products from companies such as Fischer International Systems Corp., H&W Computer Systems, Inc. and Verimation, Inc.

These vendors not only offer typical host E-mail system capabilities, such as support for terminals and centralized control, but also have ported or plan to port their software to LANs to give users multiplatform options.

Consolidated Railroad Corp. (Conrail), based in Philadelphia, is one of the organizations that has countered the trend to migrate from host mail systems to LAN solutions. Rich Kenney, manager of office systems at Conrail, has a LAN and Windows background, but wound up choosing a host E-mail system from Fischer because of the need to support terminals.

Conrail replaced a homegrown host-based E-mail system with Fischer's Electronic Mail Communication Center/Totally Automated Office (EMC²/TAO) package, software designed to handle binary files, among other things.

Although Kenney never even got to the point of formally exploring the LAN mail packages, he said installing a LAN-based product probably would have been more expensive than going with EMC²/TAO. For one thing, he knew from previous experience with LAN mail packages that he would have to hire a mail administrator for at least every 400 end users.

"With central administration of the Fischer system, we can really control our administrative costs," he said.

But the primary reason Kenney decided to stick with a host-based mail package was that more than half of the 7,000 Conrail E-mail users have terminals rather than personal computers. Moving to a LAN-based system would have meant giving PCs to users that do not necessarily need them, he said.

Vendors

Continued from page 37

users to revise numbers and recompute values in the original spreadsheet file.

OLE 2.0 extends the linking and embedding functions of OLE 1.0 by allowing users to drag and drop application objects from one window or application to another. It also allows users to click on an object and pull up another program without leaving the original application. The only things that change on a user's screen are the tool bars and menu items, which are swapped in and out to reflect the program in use.

PSEUDO OLE

It is clear that it will take some time for OLE technology to mature and become widely available in third-party Windows programs. Until then, users that want to integrate desktop applications across a network have another option.

Lotus has built a pseudo, distributed OLE functionality into many of its office productivity applications, including its Ami Pro word processor and Freelance graphics program. Lotus several months ago introduced interface software called the Lotus Application Field Exchange (AFE), which enables users to embed applications as objects within Notes databases and vice versa.

AFE uses Microsoft's OLE 1.0 and the Notes application program interface to support the two-way exchange of objects between Notes and Windows applications (see graphic, page 37). This allows users to embed within Notes a document created on a Windows-based word processor such as Ami Pro. Users define fields within the document that they want to be published in a Notes view. Whenever a user modifies

NORFOLK SOUTHERN

Rob Leftwich, information systems consultant at Norfolk Southern Corp., a Roanoke, Va., transportation firm, said his company's installed base of 11,000 desktop systems — including PCs equipped with terminal emulation cards — was the primary reason for choosing a mainframe-based E-mail system.

Leftwich said he heard the cost-saving claims of LAN mail vendors, but switching to a LAN system would cost more than moving from his homegrown host-based system to the Verimation Memo package he installed. The E-mail net will support an estimated 28,000 users by year end, he said.

"We have looked at the cost, but since the connectivity was there already, our decision was obvious," Leftwich said. "If we had to buy software for the LAN, that money would have to come out of the departmental budget, plus there would be an MIS expense to install gateways between the LAN and our hub."

The LAN systems would also result in heavy expenses for training LAN E-mail administrators and rolling out E-mail enabled applications such as forms routing. "The cost of adding users to the host-based system is incremental," he added.

Ray Sperber, director of technical services at Blue Cross of California, a Woodland Hills, Calif., insurance company, said moving away from the company's IBM Office Vision/MVS E-mail system to a LAN-based E-mail package would have been expensive.

If the LAN-based E-mail software cost \$50 per user, it would have cost the insurance company as much for the LAN software as it did for the EMC²/TAO system it decided to install, he said. And that does not even include the added management costs that a LAN mail system would carry.

Like other users, Sperber said his company needed to move to a new system that could accommodate his installed base of users, many of which have terminals rather than PCs on their desks. The EMC²/TAO system is supporting about 11,000 end users, and is serving terminal users and users that need Windows support on PCs attached to LANs. ■

one of the fields in the Ami Pro document, the corresponding field in the Notes view is also updated.

The process also works in reverse. Any user that has access to the Notes database can modify the Notes view if authorized, and those changes are reflected in the Ami Pro document.

Also, a Notes form or application may consist of numerous views, each of which could be an embedded object, such as a word processing document, spreadsheet or graphics program. In essence, Notes allows network users to jointly create and modify compound documents stored as Notes forms or applications.

Moreover, through Notes' replication services, users can distribute those compound documents to other Notes databases running on disparate platforms elsewhere on the corporate network. The remote users can then view, update or modify the Notes form and replicate those changes back to the original database.

"Notes gets us around the fact that OLE doesn't work across platforms and networks," said Jack Armstrong, Lotus' SmartSuite product manager.

Although AFE does not establish active links between applications across a network like distributed OLE will do, it satisfies most needs users have for blending information from different applications, Armstrong said.

Armstrong added that AFE is a reliable way for users to share applications and data across a network since it uses Notes replication services and does not require an active network link. ■

Bachman

Continued from page 37

the same levels of reliability and performance that have characterized the mainframe environment.

"I believe that our acquisition of Cooperative Solutions will enable us to offer a full suite of products that allows large corporate customers to successfully make the transition to distributed computing," Boni said. "With the addition of Ellipse, we think users will now be able to move from developing departmental applications to the larger world of applications that really run the business."

©Bachman: (617) 273-9003

Cooperative Solutions joins Bachman

Bachman Information Systems, Inc.

Based: Burlington, Mass.

1992 revenue: \$36 million

Founded: 1983

Primary business: Model-based, computer-assisted software engineering tool

Primary products: Bachman Generator for PowerBuilder, Bachman/DBA Enabler for SQL Server, Bachman/Database Design Kits and Performance Architek

Cooperative Solutions, Inc.

Based: San Jose, Calif.

1992 revenue: Not available (privately held firm)

Founded: 1989

Primary business: Develops and markets application development, testing and maintenance tools for distributed client/server applications

Primary products: Ellipse Development Environment and Ellipse Production System

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: NETWORK WORLD

BRIEFS

Continued from page 37

manager via the EMC²/TAO Client for Windows product.

Previously available only for stand-alone local-area network users, LAN/mainframe and LAN/mid-range clients, the Naples, Fla.-based firm's new package enables users to off-load processing from the mainframe to the client personal computer. The new product supports Windows 3270 emulators from Attachmate Corp., Digital Communications Associates, Inc., Novell, Inc. Network Software Associates, Inc., IBM and Wall Data, Inc.

The EMC²/TAO Client for Windows software is available now for \$200; quantity discounts are available upon request.

Fischer: (800) 237-4510.

Uniface Corp., an Alameda, Calif., vendor of client/server application development software, has announced new partnerships with key Hewlett-Packard Co. software providers and consulting integrators that will let customers develop and deploy integrated client/server applications. Uniface's new partners for HP customer support include Bradmark, Dynamic Information Systems Corp., Walker Richer & Quinn, Inc., Innovative Information Systems, Inc. and Meta Technologies, Inc.

Uniface: (510) 748-6145.

UES, Inc.'s Knowledge Integration Center (UES-KIC) subsidiary, based in Dublin, Ohio, next month will announce two new modules — Connect-It and Fold-It — for its Knowledge Integration (KI) Shell work flow application development tool.

Connect-It is a new module that will let KI Shell work flow users interact with mainframe applications via the High Level Language Application Program Interface

(HLLAPI).

Connect-It will be offered as an optional module, initially for the IBM RISC System/6000 and OS/2 platforms. Pricing for a development license will start at \$4,000, while run-time license pricing will start at \$250. Fold-It is a new module that allows work flow users to organize information into folders. It will be part of the base KI Shell product and will be available for no additional charge. Both products will come with KI Shell Version 1.2, which will begin shipping Oct. 15.

UES-KIC: (614) 792-9993.

PeerLogic, Inc. and IBM recently announced a marketing and technical partnership under which the firms will ensure the compatibility of their distributed computing middleware, Pipes Platform and AnyNet/2, respectively. Pipes Platform is message-oriented middleware that functions as a distributed operating system linking applications running on multiple platforms and nets. AnyNet/2, based on IBM's Multiprotocol Transport Networking architecture, also lets users connect applications across multiple platforms and nets. Pipes Platform costs \$365 per net unit, and AnyNet/2 costs \$150 per workstation.

PeerLogic: (415) 626-4545.

Blyth Software, Inc. recently announced OMNIS7 for the Application System/400, a client/server development environment that lets Windows and Apple Computer, Inc. Macintosh clients access data on AS/400 computers. OMNIS7 provides connectivity to the AS/400 via Microsoft Corp.'s Open Database Connectivity interface, Apple's Data Access Language, Information Builders, Inc.'s Enterprise Data Access/SQL and TechGnosis, Inc.'s SequeLink. It will ship this fall.

Blyth: (415) 571-0222.

At Chipcom,[®] switching technology isn't just hot this year.

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For most of the time they've been in business, other network hub makers have built simple connectivity devices for departmental LANs.

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Editorial

In June, I talked about the divergence in opinions regarding our coverage of Asynchronous Transfer Mode (ATM). Since then, I've heard from a number of readers and had the opportunity to talk with users and vendors about this pivotal technology, and an interesting split has become evident.

For the most part, users have pushed for even more coverage. This was particularly clear in focus groups conducted with readers in San Francisco and Stamford, Conn. Group members had varying responsibilities, but they almost unanimously asked for more ink on ATM.

These users and the other readers who wrote, faxed or called cautioned us to skip the sales pitches and focus on issues such as how ATM will — or won't — work with other services, and how it will be priced and deployed.

But almost to a person, vendor executives I've met pointed accusing fingers at the press for overhyping ATM and inflating user expectations. The criticisms were leveled even while some were detailing their ATM plans. Case in point: INTEROP 93 August. The show was virtually an ATM love-in, yet I was warned by the top guns at 3Com, Cisco Systems and SynOptics, among others, that we were overdoing it on ATM. A healthy chunk of our ATM coverage has focused on vendor product and service plans, yet these same vendors say we've gone overboard. Go figure.

A common vendor claim is that users are years away from deploying ATM. But that misses the point. Users realize that ATM products and services, while not widely available, will have a major impact on their networks in years to come, and they want to know more about the technology.

That's put vendors in a tough spot. They have to be upfront about their ATM strategies — even if they haven't really thought them through — or risk looking like laggards at this critical time for grabbing share of mind. But making promises means delivering down the road, and that means committing R&D resources today while demand for ATM is far from clear.

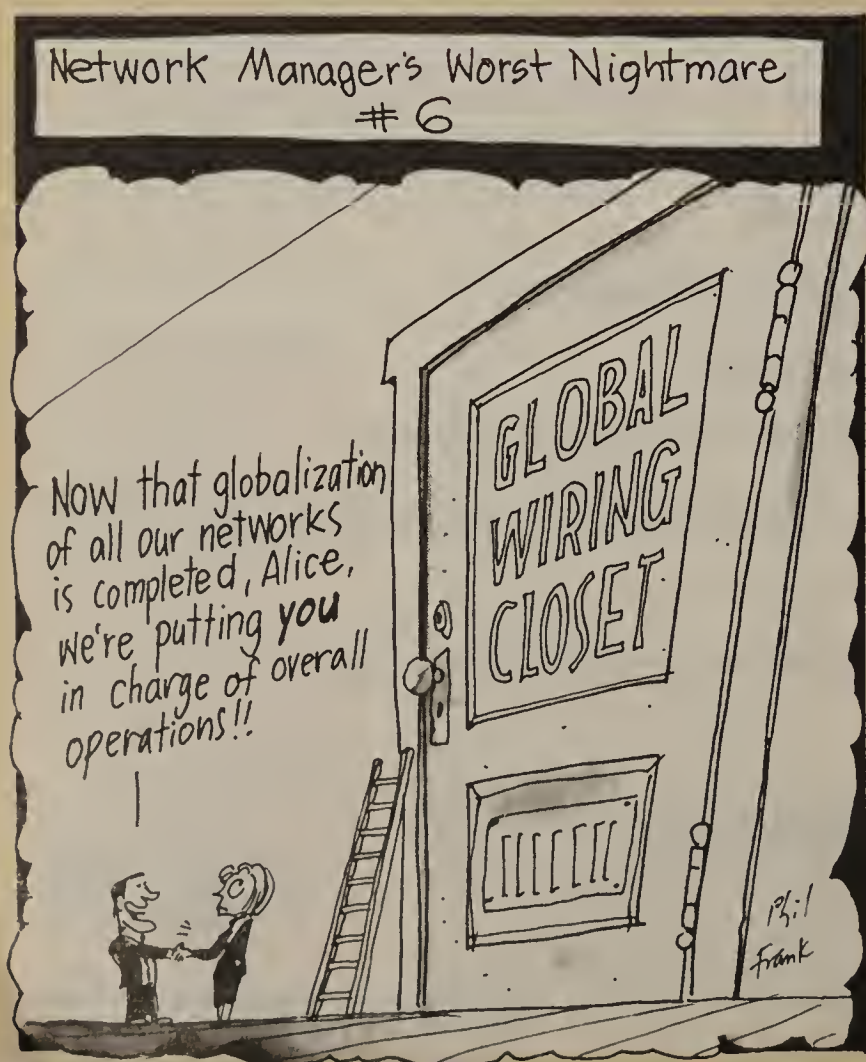
Worse, rising interest in ATM could chill demand for current technologies. While some can't hold out for cost-effective ATM products, others want to wait for ATM and avoid investing in interim technologies.

On this one, I side with the readers. We'll try to get to the core issues regarding deployment of ATM and how ATM will interoperate with existing products. And, to keep the dialogue going, let me know what you think those issues are.

→ JOHN GALLANT

Teletoons

FRANK AND TROISE



THE BLUE VIEW

by Anura Guruge

APPI demise is second strike against Cisco's SNA strategy

Cisco Systems, Inc.'s abrupt about-face on its bold promise to deliver Advanced Peer-to-Peer Internetworking (APPI) solutions (*NW*, Aug. 16, page 1) was indeed regrettable for the networking industry. The consequent demise of the APPI Forum, a group committed to promoting an open APPN, was tragic. The overall timing could not have been worse.

Just a month ago, in my last column, I discussed how the Systems Network Architecture community at large is currently wary of SNA-related offerings' stability on bridge-routers (*NW*, Aug. 16, page 36). Large-scale vacillations of this nature, particularly about supposedly strategic offerings, certainly do not help assuage these fears. APPI now becomes yet another example of SNA users being jerked around by bridge/router vendors.

Unfortunately, this APPI reversal is not the first time Cisco has changed its mind at the eleventh hour concerning delivery of its widely publicized SNA strategies. But let's hope it is the last. SNA users are desperately seeking leadership, commitment and credibility from the market leaders — not empty promises.

The rationale for Cisco's decision to ditch APPI — after demonstrating APPI (albeit on an IBM RISC System/6000) with so much fanfare at INTEROP in February — raises some intriguing and disturbing issues. Before we explore these, we should acknowledge APPI — or, to be more precise, the APPI Forum — for what it was and what it achieved.

APPI, without doubt, was the catalyst that hurried IBM into making Advanced Peer-to-Peer Networking the semiopen standard it is today (*NW*, Dec. 7, 1992, page 51). To assume that APPN is as open as SNA was, or, to an extent, still is, would be a travesty. Non-IBM vendors still can implement SNA solutions without getting a license from IBM or running afoul of patents. In contrast, APPN is still protected by a phalanx of patents, and non-IBM vendors require a yearly license from IBM — in the form of the APPN Technology Package — in order to implement an APPN Network Node or even a lowly End Node.

However, before the advent of APPI around this time last year, even this level of openness was not there. Then, the only way to access APPN technology was with IBM's \$400,000-plus-royalties APPN source code deal. Now, in addition to the technology package, the APPN architecture has been published, and IBM even sponsors APPN/APPN Implementers Workshops (AIW) to propagate APPN/Advanced Program-to-Program Communications information across the industry.

Thus, the threat of alternate, "open" APPN solutions in the form of APPI products, as well as the collective potential clout of the APPI Forum members — which included BT, Cabletron Systems, Inc., Cisco, Digital Equipment Corp., Hewlett-Packard Co., McDATA Corp., Proteon, Inc., SunConnect and SynOptics Communications, Inc. — did achieve its primary goal: to open up APPN.

However, the struggle to keep IBM on an open path is far from over. IBM continues to relentlessly roll out new networking technologies. AnyNet, High-Perfor-

mance Routing (aka APPN+) and IBM's Asynchronous Transfer Mode offerings are just a few recent examples.

Some of this technology — ATM for a fact — is protected in much the same way as APPN. IBM, as with its APPN, intends to license this type of networking technology. However, without prodding from a vociferous pressure group such as the APPI Forum, IBM may drag its feet, as it initially did with APPN.

The term APPI Forum may have now become inappropriate because we no longer will have any APPI offerings. But the pressure group that it represented still has a role within the industry and market.

To believe that IBM's AIWs will provide the same platform for applying pressure on IBM to open up its new networking technologies is to be somewhat naive: It is akin to letting a fox guard the chicken coop! If vendors are unwilling to keep the pressure group going, despite APPI's demise, maybe the time is now ripe for an SNA user community-driven advocacy group.

Now that we have put APPI in perspective, it is appropriate to examine Cisco's decision to bail out. Cisco cited possible infringements of APPN patents as the reason why it decided to abandon APPI. This is ironic considering that circumventing the patents and IBM's iron grip on APPN was the primary goal of APPI.

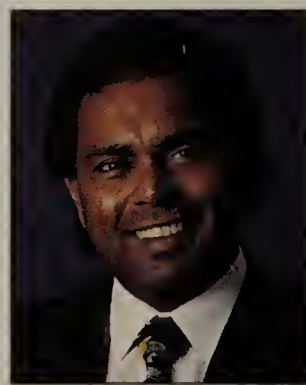
Be that as it may, why wait to abandon APPI until this late date — a month or so before it was due to be available? APPI's potential problems in overcoming the APPN patents were well understood even at the start of this year and were even written about in some technical publications at the time of Cisco's APPI demo at INTEROP. Did it take Cisco this long to fully evaluate the technical and legal ramifications? Or was Cisco milking the APPI publicity until the last minute?

Cisco's about-face on APPI could be excused if not for its reverberating similarities with its decision to opt out — again, after nearly a year of talking about it — of implementing SNA Type 4 node-based SNA routing in January 1992. One such reversal of direction could have been an accident; two reversals look distinctly careless.

Cisco's excuse for not pursuing the Type 4 option was its technical complexity. As with the APPN patent issue, the impracticality of attempting to implement a full Type 4 node in a bridge/router were well known and could have been easily established. Cisco, rather than IBM, has continually strived to be the leader in SNA internetworking. Gaffes like this hurt its credibility and the industry at large.

Cisco is now working on its third ambitious SNA-related initiative — the channel attachment of its bridge/routers. Let's hope that this does not become strike three!

→ Guruge is an independent consultant specializing in internetworking and IBM network architectures. He writes extensively, presents seminars worldwide and can be reached at (603) 878-1303 or via Internet/MCI Mail at aguruge@mcimail.com.



CELLULAR COMMUNICATIONS

by Ira Brodsky

AT&T-McCaw deal may help users

AT&T's planned purchase of McCaw Cellular Communications, Inc. has met considerable opposition, much of it from competitors who, it seems, would rather square off in the courtroom than in the marketplace. Lost in this mess is the fact that the deal could prove to be a boon to business users, who stand to gain from not only the bundling of wireless access and long-distance services, but also the impetus an AT&T-McCaw partnership might bring to the emerging personal communications services (PCS).

In an era marked by the decline of IBM and a general trend toward corporate downsizing, it should be apparent that bigger is no longer necessarily better. The intended AT&T-McCaw combination carries as much risk as potential gain. The two might leverage each other's strengths, but they might just as easily weigh each other down.

We forget that a major part of this deal involves AT&T's purchase of McCaw stock held by another global telecommunications giant, BT. If the combination of McCaw and a major interexchange carrier will automatically lead to an "unfair advantage," why is BT (which has partnered with MCI Communications Corp.) cashing out? And speaking of AT&T's competitors, no need to worry about MCI and Sprint Corp.: They are already in the process of building their own wireless partnerships.

It is ironic that those complaining loudest about how an AT&T-McCaw combination might thwart competition are three regional Bell holding companies — all of which still enjoy, for the most part, local access monopolies. Sure, AT&T might leverage McCaw's cellular nets to bypass the local exchange carriers. But the flipside is this: With

wireless technology as the enabler, the local exchange carriers (most of which already own cellular nets themselves) would get the competition they profess to support, users would have a choice of local access providers, and "universal service" would take on new meaning — not just service in the home and office, but literally everywhere.

The fact remains that for an AT&T-McCaw combination to realize any advantage, a lot of hard work must be done. A problem AT&T has is that McCaw's net covers less than one-third of the U.S.'s total population. To provide nationwide wireless access, AT&T will probably focus its attention on PCS.

Here's where things really get interesting. It is a foregone conclusion that most, if not all, PCS franchises in the U.S. will employ the spread-spectrum flavor of digital radio. And to increase their capacity, improve their operating efficiency and offer enhanced services, cellular telephone networks are beginning to migrate to digital, too. But cellular carriers are divided as to which digital radio technology to use.

McCaw has aggressively supported the first digital cellular standard to come along: Time Division Multiple Access (TDMA). The case for a spread-spectrum solution — Code Division Multiple Access (CDMA), developed by San Diego-based QUALCOMM, Inc. — has been so overwhelming that the industry has been forced to adopt CDMA as a second "standard." PacTel Cellular, US West NewVector Group, Inc. and Bell Atlantic Mobile Systems, Inc. are among the cellular carriers who have taken the plunge and announced plans to deploy CDMA, and others are

clearly leaning that way.

After being warned for years that Europe was way ahead of the U.S. because of its plans to construct TDMA-based digital cellular networks, we are now discovering that TDMA is neither simpler nor more mature than CDMA. In fact, it turns out that Europe's implementation of TDMA has some rather serious problems; for example, it inadvertently causes mobile phones to interfere with hearing aids. Worse, no one knows what to do about it. TDMA is a technological dead end, and McCaw would be wise to abandon it.

If, on the other hand, McCaw supported CDMA, there would be a big opportunity for pocket-sized handsets that work over both PCS and McCaw's cellular networks. Eventually, there might even be wireless private branch exchanges and residential cordless telephone base stations that would work with those same handsets. Now we're talking mass market.

Before we break up the AT&T-McCaw colossus, we should think about whether the net effect will be to prevent one imagined monopoly or protect several established ones. If AT&T and McCaw want to swim against the stream and "upsized," let them. The only threat they pose to local exchange carriers is they might offer users better services at lower prices. But to pull it off, AT&T and McCaw will have to make some tough technology choices.

♦ Brodsky is president of Wilmette, Ill.-based Datacomm Research Co., which publishes reports on emerging wireless technologies. He is also chairman of the upcoming Wireless Data Conference & Exposition, to be held in Santa Clara, Calif., on Oct. 27-29. Brodsky can be reached via wireless E-mail at his Internet address: brodsky@radiomail.net.



Letters

CNE is not the issue

I get the feeling that your editorial board has an ax to grind with Novell, Inc. Earlier this year, your readers were treated to a largely erroneous opinion piece complaining about how easy it is to become a Novell Certified NetWare Engineer (CNE). Now in your Aug. 2 issue (page 33), you hammer Novell from the other side with Douglas Welch's whining about the high cost of Novell's CNE.

Unfortunately, Mr. Welch also either overlooked or ignored a few key points. First, there is absolutely no course attendance requirement involved. A qualified and knowledgeable person may become a CNE merely by passing a minimum of seven tests administered by Drake Training and Technologies, a

third-party testing organization. At current prices, those tests would cost \$510. Frankly, I don't know how much less expensive Novell can make the CNE.

Second, for those who may not be fully prepared for testing, Novell provides several options for both self-study and instructor-led study through Novell Authorized Education Centers (NAEC). Self-study options include both computer-based training and study guides for most Novell course offerings, or even the complete student kit, without taking the course itself. Used copies of these products are frequently offered for sale by successful CNE candidates after they complete their testing, often at substantial savings; keep an eye out for them on popular bulletin board systems or even on Novell's NetWare forums on CompuServe.

Third, there is a substantial cost involved in providing Novell's course offerings themselves. To ensure the continuing quality of instruction, Novell requires that its courses be offered only at NAECs by Certified NetWare Instructors

(CNI). Both NAECs and CNIs must meet strict requirements — NAECs for facilities and equipment, and CNIs for knowledge and instructional skills. None of this is cheap, and someone has to pay for it.

Finally, it seems obvious that Novell never intended for its certification programs to become de facto standards, yet the industry was hungry for some "universal" certification that would guarantee a minimum knowledge level. The CNE has filled that void, however unintentionally, and today you find it listed as a prerequisite for many jobs that have no involvement with NetWare. It's no wonder that more than 25,000 persons have achieved CNE status worldwide and that more are seeking it every day.

One of the biggest issues that Novell faces today in education and certification is the apparent dilution of quality, indicated by the proliferation of "paper CNEs," who have passed Novell's testing but have no prior real-world experience with NetWare.

Frankly, rather than making the CNE easier or less expensive to

achieve, let's hope that Novell begins "raising the bar" in several ways. We should see the introduction of new, more realistic and challenging courses to replace several of the current ones. Also expect the current rote testing techniques to be replaced gradually with new performance-based testing as new courses are introduced.

If there is a shortage in our industry, as Mr. Welch believes, it is not of CNEs; rather, it is a shortage of people who are trained or experienced in networking technology and applications in general. That is the problem we need to address.

Roger Kresge
Network system engineer and CNE/CNI
Inacom Information Systems
Lancaster, Pa.

ATM overload

I just picked up my copy of your Aug. 23 issue and laughed uncontrollably (to myself).

Those poor individuals who believed you were devoting too much coverage to Asynchronous Transfer Mode (ATM) are probably gagging about now.

See Letters, page 52

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In unlocking the intelligent network, carriers help users to

By MARK LANGNER

Get smart

There's little use in maintaining a storehouse of intelligence if it's kept locked or hidden from those who stand to benefit from it.

Perhaps this is most evident in intelligent network services, where the ability to take full advantage of the intelligence being built into carrier networks has not yet been fully understood, accessed or utilized by network managers. Until recently, a couple of issues have kept the intelligence of the network away from where it can do the most good — in end-user business applications.

Customers have had limited access to the intelligence that carriers use to offer sophisticated call processing services in signal control points (SCP), databases that hold the information carrier switches need to learn how to route calls, and carriers have not been able to explain succinctly how the intelligent network can be tapped to solve specific business applications. However, things are changing, albeit slowly.

Carriers, particularly long-haul providers, are carefully unwrapping the protective layers that surround the SCPs in their intelligent networks, thereby giving end users access to them. Even local exchange carriers are starting to explore what type of regulatory hurdles they face if they open up access to the SCPs in their emerging intelligent networks. At the same time, carriers are better packaging intelligent network capabilities to make it easier for customers to purchase "solutions," rather than intelligent network services.

SCPs are truly the brains behind intelligent networks. Using SCPs and the data stored within them, carriers have been offering services that enable users to specify how a call should be processed based on several criteria.

For instance, an SCP can prevent calls placed from a specific line or telephone number from reaching certain area codes, a process known as call blocking. Likewise, an SCP can route calls to a certain telephone number to different locations based on the time of day, day of the week or even the geographical region where the call originated.

Users have always been able to craft call processing applications using the capabilities of the intelligent network. However, in the past, this involved understanding what capabilities were out there. Users also were forced to fashion their applications by combining features on an 800 or virtual network service. Additionally, users were limited to the capabilities or information in the carrier network. Additional information from the customer operations, such as up-to-date automatic call distributor (ACD) status information, could not be used by the intelligent network to drive call processing.

The methods by which a call can be intelligently routed is limited only by what is put into the SCP database. And today, customer premises equipment, such as ACDs and the computers used with them, is becoming an appendage to those SCPs. That's because carriers are offering users a chance to establish direct links between customer premises equipment and an SCP.

In other cases, network managers are being given the opportunity to tap easy-to-use software tools that enable them to dip into SCPs and orchestrate how the SCP will

process calls.

Access to call processing intelligence via a direct link into an SCP enables users to exploit proprietary data, such as sensitive customer data, to drive call processing. And that can be done while retaining control over the data, which they would otherwise not want residing within the carrier network.

With such a direct link, an SCP attempting to process a call may be asked to access a secondary database at a customer site for the necessary information to process the call, or a database at a customer site may dynamically alter the SCP throughout the day to change the manner in

which the SCP processes calls.

For instance, consider a call center arrangement where information from an ACD management system is used to drive the decisions that the SCP makes for call processing. Based on information gleaned from the ACD management system, the SCP will know whether a call should be delivered to a specific site, to an alternate location or even to a voice messaging system in the carrier network that asks the caller to leave a name and number. That message can be delivered to an agent as soon as one is available.

Providing software tools that enable end users and even third par-

ties to tap into SCPs paves the way for quick development and deployment of custom call processing applications.

"A lot of the intelligent network is aimed at developing customized services quickly," says Marcus Canipe, director of product marketing for Sprint Corp. "You can program most anything into a switch if you have the time and money. An intelligent network allows you to do the same things much faster."

Without an intelligent network, Canipe says, carriers have to rewrite the operating software code of central office switches in order to get it to

Continued on page 47



BRIAN RASZKA



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SwissTelecom



Continued from page 45

route certain calls in certain ways, which is a time-consuming and arduous task. In an intelligent network, switches are instructed to look into the SCP database to learn how to route a call. When call routing needs to be changed, it only requires a slight modification to the SCP database, as opposed to rewriting the switch operating code (see story, this page).

BIG CHANGES IN THE IXC WORLD

Considering their experience with intelligent networks, it is not surprising that the long-distance providers have the most intelligent network access options available. Indeed, the last year has brought significant changes as all of the long-haul carriers have introduced new services that provide some level of access to the network's intelligence.

Local exchange carriers are a little slower in providing access to intelligence. In fact, local carriers are just now starting to roll out intelligent network services under the Advanced Intelligent Network banner. These services provide little or no direct access to net intelligence but do offer network managers the ability to craft some unique applications (see story, page 48).

Long-haul carriers are driven largely to providing access to the intelligence in their networks due to the increased competition in the 800-services market as a result of 800-number portability.

"One reason vendors are attempting to tie customers so close to their intelligent network — through things such as interacting CPE with the carrier's network — is to make the connection so close that the customer doesn't want to leave," says Mark Heckendorn, managing director of Versus Strategy Group, Inc., a Washington, D.C.-based consultancy.

Sprint was early out of the chute in offering a direct link into its SCPs. Sprint offers two services — Sprint Interface to External Routing Processor (SiteRP) and Network Call Distributor (NCD) — that enable customer premises equipment to interact with the intelligent network to determine how to route calls. Both SiteRP and NCD are geared to supporting 800-calling applications.

nect their SiteRP processors, which can be anything from a mainframe to a personal computer, to each of Sprint's five SCPs via 56K bit/sec dedicated links. The users build their own database programs on their SiteRP processors. Sprint has published an X.25 interface specification for SiteRP, which users integrate into their database program in order to allow the database to communicate with the Sprint SCP. The customer database communicates with the SCPs by interpreting X.25 messages from the SCP and returning instructions in the X.25 format.

"The key here is that users have control over their own information, and the carrier is merely working with that existing infrastructure to handle calls," says Tom Walton, president of Walton and Walton Associates, Inc., a Richmond, Va., consulting firm.

SiteRP can be used to control advanced routing features, such as the percentage of traffic to be allocated, which enables users to split all calls made to one number among multiple sites, or customized routing on the fly. For instance, a user could decide that when call queues at all ACD locations exceed one minute, the network will begin to send calls to an overflow site until call queues drop below the threshold.

Sprint is also mulling whether to allow third-party developers to create SiteRP applications. By publishing SiteRP specifications, these third parties would be able to develop commercial call processing applications that run on SiteRP platforms. This will enable users to purchase off-the-shelf call processing applications and simply tie their application to a SiteRP platform that uses the Sprint network.

For Sprint, it was a strategic decision not to provide the users with Sprint-specific software for SiteRP. "To do that really goes against the user-specific concept behind SiteRP," says Janis Gregg, group manager of 800 services at Sprint. "We didn't want to push the user into a solution."

THE ADVANTIS ADVANTAGE

Sprint's initial SiteRP customer is Advantis. In fact, SiteRP was developed as a custom product for Advantis.

Advantis uses SiteRP to allocate calls among its different call centers on a dynamic basis. An IBM 3090 mainframe polls Rockwell International Corp. Galaxy and Rolm 9751 ACDs in its call centers for their status. This information is fed into a database on the 3090, which acts as the SiteRP processor. As calls are placed to Advantis, the Sprint SCP polls the Advantis mainframe to see how to route the call based on the

ACD information.

Advantis has been handling its calls more efficiently with this system — customer service has been improved 7%, agent productivity has been improved 6%, and call abandonment has been cut by 54%.

In addition to SiteRP, Sprint is internally alpha-testing its fledgling NCD service, which also provides interaction between customer premises equipment and the Sprint network. With NCD, Sprint will monitor the status of user ACDs to provide load balancing across all agents.

With NCD, a processor in the Sprint net-

A peek inside the intelligent network

It's difficult to understand exactly what an intelligent network is. Depending on who you talk to, you will get a different viewpoint. For instance, AT&T markets its entire worldwide communications network as an intelligent network. Yet local exchange carriers try to set their Advanced Intelligent Networks apart from the rest of their nets.

In any case, the term intelligent network refers to a specific architecture that provides core capabilities in which customer-specific information held in databases within the network is used to intelligently process calls.

No two carrier implementations of an intelligent network are the same. However, there is a standard set of equipment that carriers must deploy to provide intelligent network capabilities. An intelligent network generally comprises three base elements:

■ **Signal Control Points (SCP).** These are computers that hold databases in which customer-specific information used by the net to route calls is stored.

■ **Signal Switching Points (SSP).** These are digital telephone switches, which are capable of communicating in an intelligent network environment. SSPs identify calls as intelligent network calls and query SCPs for the customer-specific instructions needed to complete the call.

■ **Signal Transfer Points (STP).** These are packet switches that shuttle messages between SSPs and SCPs.

These elements communicate with one another using out-of-band signaling, usually a Signaling System 7 protocol, to pass information needed to complete a call through the network. The signaling is considered out-of-band because it does not travel over the same transmission paths as the calls themselves. To support out-of-band signaling, intelligent networks use a "subnetwork" of data lines that links SCPs, SSPs and STPs.

As applications on the intelligent network have increased in complexity, carriers have added equipment such as enhanced processors for voice response units that can play prerecorded messages prompting callers to enter further instructions to complete the call processing function. This additional equipment individualizes each intelligent network to a carrier's own requirements.

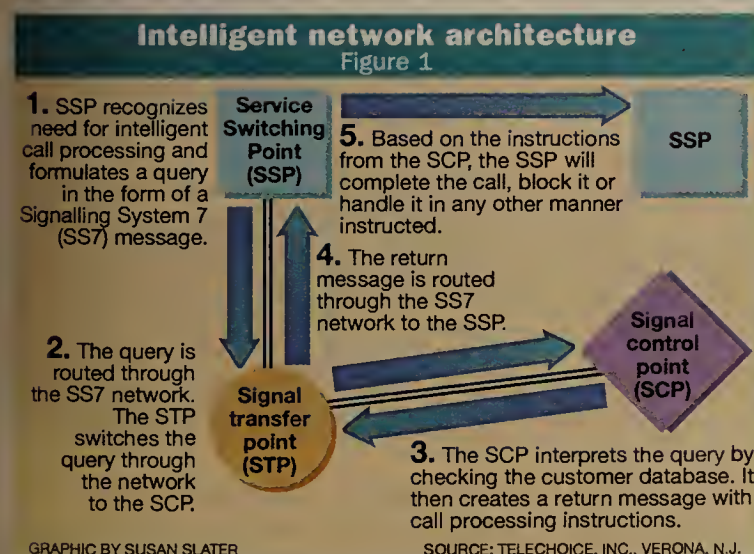
However, despite these differences, all carrier implementations of intelligent networks fundamentally work in a similar manner.

A simple intelligent network call is processed in the following manner: The SSP identifies that a call requires intelligent network processing. The SSP creates a query to find out how this call should be handled. The query is passed via out-of-band signaling through STPs to an SCP. That interprets the query based on the criteria in its database and information provided by the SSP.

Once the SCP has determined how the call is to be handled, it returns a message through STPs to the SSP. This message instructs the SSP how the call should be handled in the network.

The number of actions that could take place at the SCP are truly infinite. The call could be translated into a different number for completion; it could be routed to a user's private network for on-net handling; it could be sent to a voice response unit in the carrier network, where a message is played to the caller; or it could even be blocked, which prevents completion. It is this nature of limitless options that provides intelligent networks with the flexibility to solve specific business application problems.

BY MARK LANGNER



SiteRP enables network managers to use on-site, customized call processing equipment to control the routing of calls on the Sprint network. When a call processing query is sent to the SCP, the SCP is instructed to check a user database kept on the customer premises for instructions on how to handle that call. Once the call handling instructions have been culled from the user database, the customer premises equipment sends a message back to the Sprint SCP, which, in turn, uses that information to decide which call processing instructions it will pass back to the network switch.

To use SiteRP, users must directly intercon-

work polls each ACD over a dedicated X.25 link approximately once every 30 seconds. With the resulting information, NCD knows how to balance traffic among agents, making sure one agent is not burdened with more calls than any other agent. Currently, NCD works only with Rockwell International Corp. Galaxy ACDs.

AT&T RESPONDS

Not to be outdone, AT&T announced earlier this year its Intelligent Call Processor (ICP) offering. Like SiteRP, ICP allows users to directly link customer premises equipment to its network for individual call processing based on customer-specific information.

In addition to providing more direct access to the customer, AT&T is also addressing the need for customer solutions that use the intelligent network but don't require users to craft applications from a number of different 800 or virtual network features. Unveiled this past May, the Global Transaction Network is a spe-

cial service package that utilizes the existing intelligent network AT&T uses to support 800 services.

By tweaking the applications running on the SCPs in its intelligent network, AT&T is now able to offer six new call processing services under the Global Transaction Network banner. They are:

■ **Next-available agent routing.** Provides network-based load balancing among agents based on the number of agents available, rather than allocating a percentage of all calls to certain agents.

■ **Caller recognition routing.** Provides priority routing based on the caller's 10-digit telephone number.

■ **Transfer connect service.** Allows agents to forward calls to other offices rather than telling callers to hang up and dial a different 800 number. Agents can also conduct two-, three- and four-way conferences.

■ **Network queuing.** Provides the ability to

Continued on page 48

Continued from page 47

queue callers in the AT&T network with a reminder message every 30 seconds as opposed to queuing them in an ACD at the customer site.

■ **800 Select Again service.** An enhancement to existing Call Prompter features. This service lets users return to an automated routing system to make additional selections rather than redialing the 800 number.

■ **Multiple number database.** Allows multiple 800 numbers to be assigned to a single routing plan in the network rather than each 800 number having its own unique routing plan.

In order to support these new services, AT&T needed to upgrade the processing power of its 800 network. With its previous 800 network architecture, the intelligence needed to support certain 800 call processing applications resided on two types of SCP databases. With advanced applications, in order to complete a call, the network had to make two database inquiries to receive the information it needed. Each database query took time, which

delayed call setup and completion.

With the Global Transaction Network, AT&T replaced those two database processors with one enhanced processor, dubbed the Enhanced Network Control Point (NCP). The NCP is essentially a souped-up SCP with new software and computer processors.

With the Global Transaction Network, AT&T is attempting to transparently provide features and functions to users so additional equipment is not necessary.

"In the past, most advanced 800 applications were features that were applicable to large users," says Michael Erickson, product marketing director for advanced 800 features at AT&T. "These features were designed to meet the needs of users who already had an ACD or PBX. We now have feature functionality on 800 service that doesn't require any equipment functionality to work. That makes it applicable to the market at large."

For smaller users, this means that intelligent network functionality never before available without expensive equipment — such as

queuing or next-available agent routing — can now be purchased from the carrier. For larger users, this expands the range of services available for enterprise networks and works with the existing equipment and access method.

Users have a couple of options in loading specific call routing plans into AT&T's SCPs. They can work with AT&T customer service personnel, who will load the information for them. Or they can purchase AT&T Accumaster Management Service offerings and enter the information from a terminal at their site.

WATS Telemarketing of Omaha, Neb., an inbound telemarketing service bureau that answers 800 calls for its clients, uses an advanced terminal to enter changes to call routing plans for its 10,000 toll-free numbers into the SCPs. This lets WATS Telemarketing easily take advantage of the Global Transaction Network's advanced services.

Using Global Transaction Services, WATS Telemarketing has been able to reduce staffing and simplify the management of its advanced 800 applications. Each of the company's 800 numbers is used for different clients in different lines of business.

For instance, WATS Telemarketing answers calls and takes orders for several catalog retailers as well as several companies that sell products through television commercials. It also offers reservation-taking services and provides customer service center operations on behalf of clients.

At WATS Telemarketing, agent staffing varies greatly during the day at its two call centers in Omaha and Pueblo, Colo. Agents at both sites are grouped along several different lines.

The company has been using advanced 800 features to allocate the percentage of traffic between call centers before using Global Transaction Network services. Until recently, however, administering that feature across 10,000 toll-free numbers was cumbersome.

Each of the 800 numbers had to have its own unique routing plan in the network. When a flood of calls came into the agents taking orders for products advertised on television, WATS Telemarketing had to find out which number caused the flood and change the routing plan

Localized intelligence is coming

Users may be noticing that inter-exchange carriers are starting to go the extra mile to offer direct access to their intelligent networks. But users have yet to see local exchange carriers offer the same capability.

In fact, local carriers such as Bell-South Corp. and Bell Atlantic Corp. are just now only starting to roll out basic intelligent network services under the Advanced Intelligent Network (AIN) banner.

Ameritech is among the other regional Bell holding companies that are promising to bring out AIN services.

But local carriers are not as quick to offer access to their intelligent networks as the long-haul carriers.

Like interexchange carrier offerings, AIN services rely on database information held in the carrier network to instruct switches how to process certain calls.

Yet users of local AIN services have to trust the local carrier to enter call routing parameters into the AIN. This may be true even if the user is able to purchase dedicated AIN access services and has equipment that can interact with the AIN.

Indeed, most AIN access methods include the use of typical, everyday business lines.

Bell Atlantic has developed two AIN services, Switch Redirect and Centrex Extend, that can be accessed in the same manner as a typical business line.

Switch Redirect allows users to redirect calls destined for one site to another site. The service relies on a number of translation capabilities within the carrier network and is used mostly to avoid having calls delivered to busy or nonfunctioning locations.

To make Switch Redirect work,

local carriers force the central office switch that is delivering a call to check the status of the called party.

If the called party is busy or the location about to receive the call is not functioning, then the call is delivered to a predefined alternate location.

Centrex Extend can be best described as a wide-area Centrex offering. It allows Centrex customers to extend the capabilities of Centrex to locations served by multiple Centrex central office switches. Otherwise, users would have to limit Centrex features to those sites tied into the same Centrex central office switch. Therefore, Centrex Extend provides private network dialing and other Centrex features, such as call forwarding, over a much wider area than was previously available.

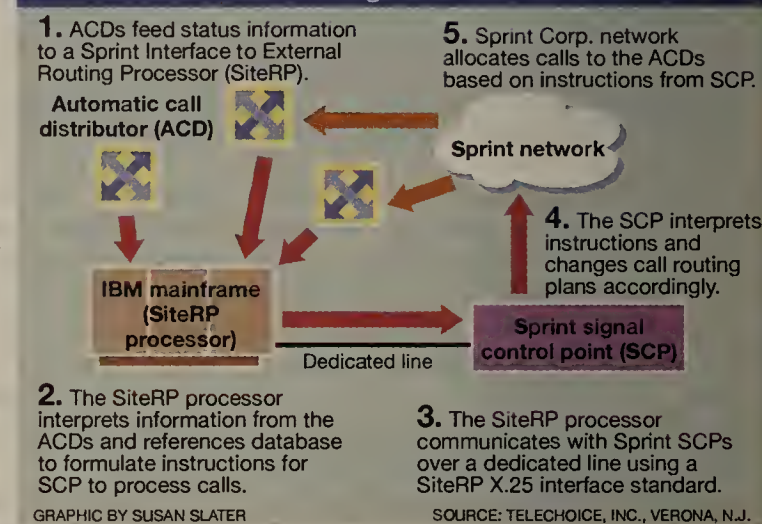
Standards for AIN have largely floundered, resulting in carrier-specific implementations. Additionally, locations in areas served by carriers not owned by an RBHC will not have access to AIN services at all, unless the non-RBHC-owned company offers AIN services itself.

Although they do not yet enable users to enter call processing instructions directly into their signal control points, Bell Atlantic and Bell-South have begun investigating the legal and technical issues they believe must be overcome before allowing users to tap directly into their intelligent networks.

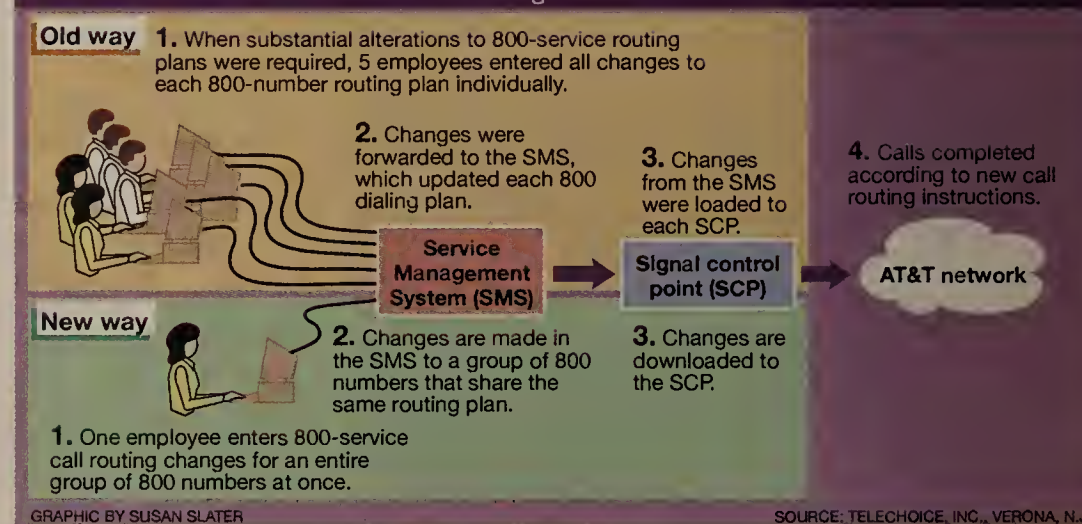
The two RBHCS are also feeling out the Federal Communications Commission to find out what legal hurdles they must overcome before allowing third parties to build custom call processing application software that can be sold to end users.

BY MARK LANGNER

How SiteRP works
Figure 2



WATS Telemarketing's take on 800-routing updates
Figure 3



For instance, there is a group of agents that answers only calls made to any of the several different catalog retailers. Another group answers only calls made in response to TV commercials run by various companies.

"Our clients have a difficult time predicting when we will have calls coming in," says Pat Derr, telecommunications manager at WATS Telemarketing. "This made efficient agent staffing to handle those calls difficult."

Given this environment, it is important for the firm to match the staff available to handle a particular type of call with the incoming call load. For instance, if 30% of agents that take reservations are in Pueblo, WATS Telemarketing would only want to send 30% of the reservation traffic to that call center.

available, operations staff had to enter routing plan changes to each 800 number through their AT&T 800-service management terminals. Those changes were fed to an AT&T management system, which fed them to the SCP.

With the Global Transaction Network's Multiple Number Database feature, WATS Telemarketing has been able to place all the numbers associated with catalog orders, for example, in a single group.

Used in conjunction with an improved 800-service management program, the company's operations staff can now upload a routing plan change for an entire group of numbers once agents for that group become busy. That eliminates the need to identify which client or numbers were causing the burst of activity, making

it possible to use rerouting to more accurately reflect agent capacity in a group at its two call centers, as well as for that rerouting to occur more quickly than before.

"This has been an enormous timesaver," Derr says. "Now we create a handful of routing plans rather than hundreds."

For instance, during lunchtime at the Pueblo site, only 30% of catalog order-takers remain active. WATS Telemarketing can change the routing plan from splitting traffic equally between its two sites to routing 70% to Omaha and 30% to Pueblo in about five minutes. Previously, operations staff would spend about five minutes changing each 800 catalog number to accommodate this routing plan.

"[WATS Telemarketing] has been an enormous timesaver. Now we create a handful of routing plans rather than hundreds."

The ability to change routing plans for groups of numbers simultaneously has enabled WATS Telemarketing to reduce operations staff to one person for management of the routing plans and one person to feed changes into the net from the management terminal. Users without management terminals can call AT&T's Advanced Feature Service Center and have AT&T personnel make the routing plan change.

What Global Transaction Network exhibits is the beginning of a trend where carriers will build specific applications using the intelligence in their network. They will then market those applications to users, obviating the need for users to purchase several services, each of which offers different functionality, in order to build custom call processing applications.

MCI'S VIEW

Like Sprint and AT&T, MCI Communications Corp. is striving to provide more direct customer control over intelligent network services, although perhaps not to the same degree as its rivals. MCI's latest efforts in intelligent networks also focus on ACD capabilities and interaction of the network with the customer premises, but the carrier doesn't offer users much of a chance to give instructions to SCPs.

MCI has announced dynamic load balancing capabilities within the network for user ACDs. With these capabilities, MCI monitors a user ACD network on a minute-by-minute basis to determine the necessary traffic load that should be sent to each site.

The MCI service works in much the same manner as Sprint's NCD. The MCI network's dynamic load balancing processor monitors user ACDs over a dedicated link using an MCI proprietary signaling standard that is based on X.25. The processor then checks a user database for routing choices and changes the percentage allocation of traffic for each ACD based on the status received from the user premises.

An interesting feature of MCI's dynamic routing capabilities is a user override capability, whereby users can call MCI and override the dynamic allocation set by the network. This would be used during a situation such as a tornado or snowstorm, where the equipment may be running great but there are no people to manage it.

However, the user has to call MCI's customer service center, which will then enter the change on the SCP.

WHAT'S NEXT

Intelligent networks are clearly being established as the backbone of carrier service offerings. Carriers will continue to use intelligence in the network to provide new and advanced call processing applications.

Part of offering those services will require carriers to extend more of an open invitation to users to tap into intelligent network components or add even more forms of customer premises equipment to their intelligent networks.

These goals can be quite lofty. AT&T, for instance, envisions using its Global Transac-

tion Network to handle more than just communications. AT&T wants to actually process business transactions for its users by having AT&T operators take orders on behalf of customers and then load those orders into customer databases over the intelligent network.

For users, the issue of interfacing with these intelligent network services will continue to be evaluated on an application-specific basis. To what extent a user wants or even needs control over the data used to drive intelligent networks will determine whether special access or equipment is needed.

"In some cases, it will not be possible or users will not trust their carrier to handle data to drive call routing applications," Walton says. "So there will always be a hybrid. Information from the carrier network and information from the user network will be used for advanced applications in the intelligent net."

♦ Langner is a senior analyst with TeleChoice, Inc., a Verona, N.J., consultancy specializing in strategic planning and analysis of intelligent networks, services and applications. He can be reached at (201) 239-0700 or via MCI Mail at DBRIERE (445-4690).



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COMPAQ
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\$ALARY

Continued from page 1

U the employees they replace (see graphic, page 1). And according to some users, employers are demanding even greater depth of technical knowledge and experience than outgoing staff, despite hiring new employees for less pay.

R One bright spot in the picture is the health care industry, which cited a robust uptick in top network professionals' salaries of 11.3% on average and a survey high salary of \$142,500 on average for senior-level network executives (see graphic, this page). Ironically, the industry also reported that its professionals had very little seniority, citing some of the lowest numbers in terms of years on the job.

KEY FINDINGS

The survey found that at the high-end of the pay scale, upper level network management — which includes chief information officers, vice presidents and directors — made an average of \$83,910 this year and project a 4.3% increase for next year.

Mid-level management — including network managers, data communications manag-

Employers tighten the purse strings

ers, telecommunications managers and technical support managers — accounts for an average salary of \$59,427, with an estimated 4% increase planned for next year.

(For a complete breakdown of titles, see sidebar, this page.)

On the LAN side, senior-level executives earned an average salary of \$52,590, vs. \$42,455 for middle-tier local-area network personnel and \$30,536 for entry-level employees.

Within the engineering ranks, senior-level salaries averaged \$59,477, middle managers earned \$47,468 on average, and entry positions paid \$33,478.

With regard to operations staff, senior executives made \$48,869 this year on average, middle managers salaries averaged \$37,457 and entry positions paid \$26,653.

Within the ranks of network applications developers, senior managers took home an average salary of \$53,701, middle management was paid \$42,509 and entry positions averaged \$31,057.

RULES ARE CHANGING

Most users say compensation levels for network staff are tied largely to industry factors that are prone to changing market conditions.

"I anticipate we will have a nominal cost-of-living adjustment to our salaries next year," says one network manager at a major power utility in Wisconsin who requested anonymity. "As far as I can see, the expectations to provide service quality and network facilities will increase, but budget dollars will remain fixed or maybe even decrease by about 5%."

Indeed, NW's Annual Salary Survey determined that companies, on average, are planning salary increases of no more than 4%.

Although utility companies surveyed by NW reported slightly higher than average net-

least, new hires will be pretty tough to get, given the situation," the manager says. "And employee retention could become a bit of a problem, given the added stress without a corresponding bump in salary."

Other industries also facing tough times echoed those sentiments. According to the sur-

and as a result, have not had to pay the kind of competitive salaries that companies like oil firms and brokerage houses have," he says. But he adds that one reason for the better than average finding could be the fact that insurance is heavily dependent on information technology.

"If you look at insurance, we don't manu-

Health care riding high

	Upper management	Senior LAN	Senior engineering	Senior operations	Senior net applications development
Manufacturing/finance	\$98,900	\$56,475	\$61,684	\$52,056	\$56,176
Insurance	\$108,750	\$57,600	\$65,000	\$51,667	\$60,570
Health care	\$142,500	\$53,000	\$91,000	\$57,500	\$94,500
Wholesale/retail	\$56,000	\$80,000	\$80,000	\$50,000	\$100,000
Utilities	\$103,466	\$60,478	\$63,237	\$56,986	\$59,832
Education	\$71,892	\$46,435	\$51,086	\$41,770	\$47,950
Government	\$79,541	\$51,051	\$57,200	\$47,459	\$51,131
Agriculture/mining/construction	\$101,763	\$60,533	\$68,577	\$55,033	\$62,036
Business/professional services	\$85,813	\$56,941	\$64,472	\$50,375	\$59,571

Across the various industries, the average networking department salary is \$59,709. Top managers in the health care industry garnered the network salary high of \$142,500, while technical positions in the educational sector reported the network salary low paid between \$41,770 and \$51,086.

GRAPHIC BY SUSAN SLATER

SOURCE: NETWORK WORLD

Title breakdown by salary category

MANAGEMENT

Upper: CIO, VP, Director, VP Data/Voice

Middle: Network Manager, Data Communications Manager, Telecommunications Manager, Technical Support Manager

LAN

Senior: LAN Manager, Project Manager
Middle: LAN Administrator, Senior Analyst, Consultant
Entry: Operator, Analyst

ENGINEERING

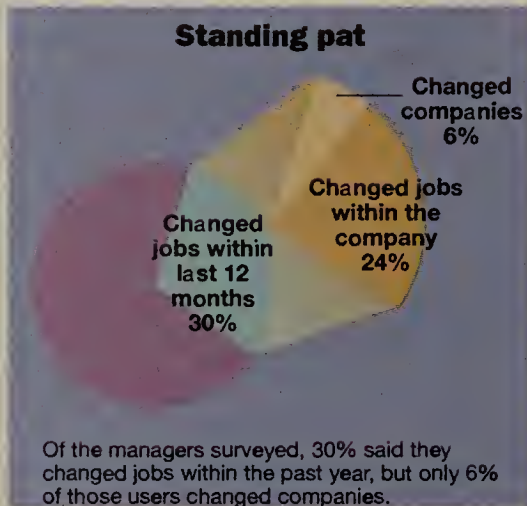
Senior: Network Architect, Engineering Manager, Consultant
Middle: Lead Designer, Senior Engineer, Senior Analyst
Entry: Designer, Engineer, Junior Analyst

OPERATIONS

Senior: Data Center Manager, Training Manager, Tech Support Manager
Middle: Training Specialist, Tech Support Engineer
Entry: Network Operator, Help Desk Operator, Tech Support Specialist, Net Management Specialist

NETWORK APPLICATIONS DEVELOPMENT

Senior: Development Manager, Programming Manager, Project Manager
Middle: Lead Programmer, Senior Systems Analyst, Database Administrator
Entry: Client/Server Programmer, Systems Analyst



working salaries, the user says compensation levels could change markedly over the next few years as deregulation takes hold. The utilities industry is gearing up for heightened competition from other regulated utilities as well as nonregulated businesses that want to sell excess power from their private facilities.

"All the rules are changing," the user says. "People won't be forced to buy power from their local utility anymore, and the increased competition is going to force us to be more efficient. It's going to make adding new positions more difficult, and it will also function as a limiting factor to expanding salaries."

The atmosphere could also be a talent drain in the utilities industry. "At our company at

vey, the government sector weighed in with the lowest average annual percentage increase in salary, increasing by just 3.4%, a figure that fails to surprise Len Evenchik, director of communications for the Commonwealth of Massachusetts in Boston.

"Government rarely gives increases larger than the rate of inflation — rarely," he says. "Almost every state government I know is currently reducing staff, and it's very difficult, if not impossible, to raise salaries at the same time as you're reducing staff."

The lean times are a direct result of public pressure to bring expenses more in line with revenues, he says. "State government has certain expenses that we call budget busters," he says. "Things like welfare and health expenses like Medicaid benefits tend to consume most of the discretionary dollars of the budgets from year to year. And since [Massachusetts] Gov. Weld is working hard to keep spending flat, there's just no growth. And this has been going on for about two to three years now."

As an aside, Evenchik says that as a top network manager in the government sector, he has not received a raise in salary in five years.

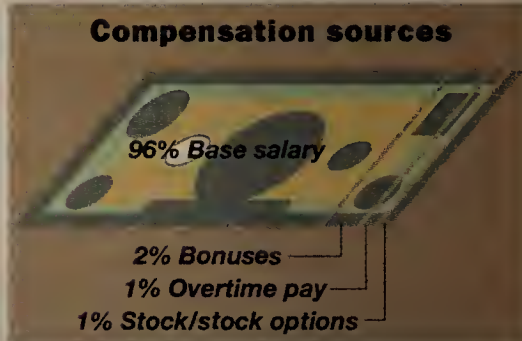
BRIGHTER OUTLOOK

Other industries paint a slightly brighter picture. Keith Sievers, vice president of information processing and treasurer at Federal Kemper Insurance Co. in Decatur, Ill., says he expects his firm will provide better than cost-of-living increases.

"I see salaries going up next year — a little better than cost of living," he says. "We've always tried to have pretty good pay scales here, and I expect we'll end up doing half a point to a point better for the average merit increase than the cost of living."

According to the survey, the insurance industry came out well above other sectors in terms of annual salary and annual percentage increase over last year, a fact that surprised Sievers. "Insurers have traditionally been more stable types of employers

facture a product," he says. "Essentially, we sell service, and service is based to a great extent on how well we can manage our data and our information. I think insurance companies as a whole rely on information technology more, so it probably makes up a greater portion



of the operation than, say, a manufacturing concern. And it takes money to pull good people in."

HEALTH CARE PHENOMENON

Although health care came out on top in this year's survey, some representatives from the industry say they are not faring as well as the average survey respondent.

"Our percentage increase here is closer to government's," says a director of networking at a major Boston-area hospital who requested anonymity. "I think everybody's kind of biting the bullet these days. It's more whether you get raises at all. I haven't seen too many as high [as those reported in the survey]."

One reason for the healthy salary picture reported in the survey could be a change in the industry's attitude toward information technology, he says.

"Health care is an industry that is beginning to look at information technologies more as a strategic asset than before," he said. "Certainly, with newer systems in networking, things like higher speed networks, the really big bandwidth applications such as teleradiology and telepathology are becoming reality now."

Survey respondents, on average, have held their current job for 5 years, have been with their company for 11 years and have 16 years of industry experience.

And I think that might be demanding a higher level of staffing resources."

JOB HOPPING SLOWS

One result of the survey that users agreed rings true is that job hopping is beginning to slow. Just 6% of those surveyed have jumped companies in the past year. However, 24% more respondents did switch positions within their existing companies.

"That doesn't mean people are happy with their employers," said Larry Buresh, vice president and chief information officer at Frank's Nursery and Crafts, a retailer in Detroit. "They're just more afraid to take the risk of going to another company, especially with all the recent layoffs and downsizing."

Management Recruiters' Schoff said there are a lot of people looking for jobs relative to the number of positions available. "That, in its simplest form, would say it was a buyer's market," he said.

"Employers are being extraordinarily selective, and they can afford to be," he said.

How the survey was conducted

Network World's Eighth Annual Salary Survey is based on 874 responses from a randomly selected sample of 4,000 readers who manage their company networks.

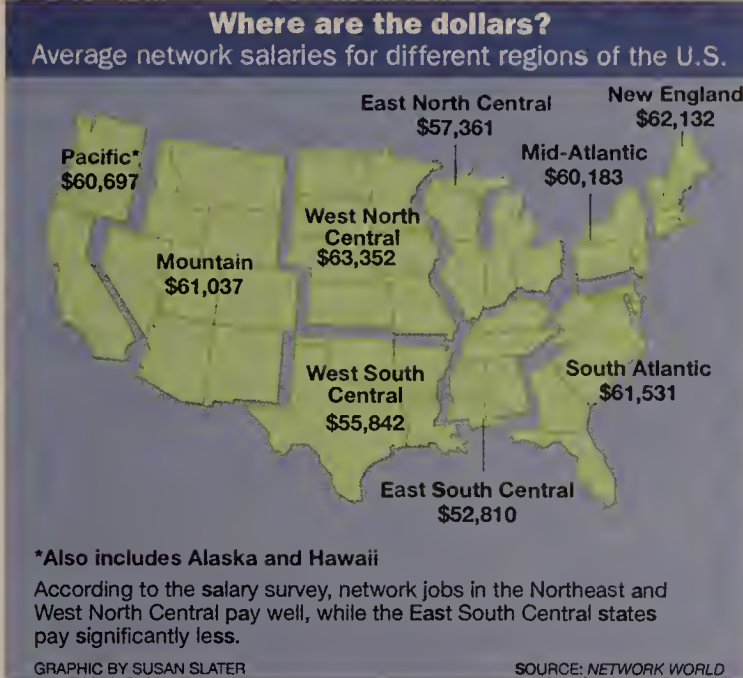
To ensure that the sampling would accurately reflect that the U.S. networking population, network sites were chosen from a breadth of industries. NW invited only user organizations that specify, recommend or approve purchases of \$1 million or more annually in networking equipment and services to participate in the survey.

When respondents were asked for their primary area of responsibility, 42% indicated they have MIS/DP oversight, 28% said they have control over voice, data and local-area network networking, and 16% controlled data communications only. Another 13% indicated they were primarily responsible for LANs. Of the 874 respondents, 53% fell into the management category, 16% fell into the LAN job category, 13% represented engineering, 12% fell into the operations sector and 6% represented network applications development.

The survey form prompted network managers to provide salary and related information for each individual, as well as the various positions that report to him or her. The information was collected using a four-page questionnaire which was mailed to readers on July 8, 1993.

Under the direction of NW Research Director Anne MacKay, answers were compiled into a database. The information was then averaged and cross-tabulated by vertical industry and geographic region.

BY JOANNE CUMMINGS



"They're not simply hiring the cheapest employee, but are being very selective and precise in terms of the skills they're looking for. And when they do find that person, because the market is rather competitive, they can hold the line on salary."

CHEAPER TO REPLACE

Schoff's analysis meshes with the survey results, which indicate respondents can hire replacements for a variety of networking positions for about 11% less than the current employee's average annual salary.

At first glance, this does not bode well for today's networking professionals. "That finding's definitely a worry," said Don Davis, manager of micro-computer support services at Boston University. "Networking is a cut-throat business, and I would not be surprised to see people with a great many years' experience being replaced by younger, less experienced people, as a cost-cutting measure."

But the findings may also be attributed to less cutthroat motives. "Basically, it's standard policy to never hire someone above the midpoint in a salary range," Davis said. "Because if you do, you could have trouble promoting the employee later. There's nowhere to go."

Other managers interviewed said the findings could also be explained by the fact that a networking professional who retires with 30 years' experience is certainly going to be replaced by a younger employee with less experience, thus requiring less compensation.

"If people stay with their companies a long time, salary levels build up," Sievers said.

Many companies lately have been offering their more senior, high-salaried people early retirement as a cost-cutting measure, according to Buresh. "They can move those people out and higher younger, less expensive employees in their place."

WHERE THE MONEY IS

Some positions that may be insulated from the tight market, however, include specialists in client/server and distributed technologies, as well as users with a range of expertise, such as programming in COBOL, C and object-oriented languages or those with experience in a variety of LAN operating systems.

"The commodity of choice in the net application development world will be people who are Windows-, C- and object oriented-literate, as opposed to the traditional Big Blue COBOL code pusher," one manager said. "By and large, any new development will happen on those non-traditional platforms."

"Skills related to client/server or distributed computing, both from the software side and the network side, are much in demand," Evenchik said.

"We're currently upgrading our technology from the legacy mainframe systems to new client/server platforms, and people are having to be retrained in those new arenas." He said that, as a result, salary budgets may not be increasing much but his training budget is ballooning.

REGIONAL RATES

According to the survey, network professionals in the Northeast and Western Midwest regions of the country garner the highest salaries, while managers in the East South Central region take home the lowest (see graphic, this page). Basically, most of the differences among regions can be attributed to cost-of-living factors.

"It depends on factors such as the cost of housing and personal services," Schoff said. "For example, I've placed people who have

moved from New England to the Carolinas with between 10% and 20% reductions in compensation. But in the end, they had greater spending power because the cost of living is so much cheaper in the Carolinas."

Others thought certain regions may need to offer better pay incentives to counteract factors such as bad climates. "In the Midwest, there's probably a drain of talent in that most people would rather go and move where the weather was a little better," Buresh said, from his rainy Detroit office.

Still, regional salary averages did not differ much, showing just a 16% gap between the most affluent region, West North Central, and the least affluent, East South Central.

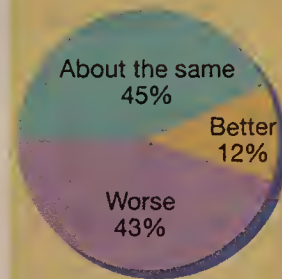
SALARY OUTLOOK

Overall, NW's Annual Salary Survey shows that network professionals' compensation, although still on the rise, is not at all reminiscent of the heady days of networking, where hefty average annual increases regularly weighed in at 10% and 15%. Because of the slow economy and the increasing number of companies driving to downsize and squeeze the most out of every buck, today's network professionals are witnessing slow salary increases and a job market that's uncertain at best.

"Everybody is expected to do more with less," said the network manager at a Wisconsin utility company. "You're expected to produce more widgets at the end of the day by working smarter, knowing more and doing everything better. That sounds great, but in the practical sense, one can only push it so far before the staff completely burns out."

♦Cummings is a free-lance writer based in Marlborough, Mass.

How do you think your compensation compares with others in similar positions within the industry?



More than 9 out of 10 survey respondents, or 91%, were men.



Help desk

Continued from page 2

What are some PC- and VAX-based software products that convert incoming faxes into ASCII files that can then be read by other programs?
Patricia Anderson, Morton Grove, Ill.

Carl Reid, computer systems analyst and director of NetTECH SYSTEMS, a free, 24-hour computer information hot line in Jersey City, N.J., replies:

When a document is faxed, it is received in a bit map file format. Bit mapping is used because all faxes are sent as graphic files even if no pictures are in the faxed document.

In this format, text editors or word processors cannot be used to modify the document in its "bit mapped" format. Converting any type of file into ASCII provides a universal method for manipulating text using any word processor. There are quite a few facsimile packages that perform ASCII conversion.

The key component for ASCII conversion is optical character recognition (OCR). Verify that the fax software you are considering has OCR capability. Delrina Corp.'s WinFax PRO for Windows presents the user with a menu selection to save the received fax as an ASCII file. WinFax PRO costs \$129.

Another fax conversion package is FAXGrabber by Calera Recognition Systems, Inc. FAXGrabber for Windows allows you to

convert a fax to more than 50 popular word processor file formats. FAXGrabber costs \$89.

For product information, call Delrina at (800) 268-6082 and Calera Recognition Systems at (408) 720-0999.

Charles Viau, an engineer at Valinor, Inc., a Manchester, N.H.-based systems integrator, adds:

Two products that provide fax conversion to ASCII format on the DEC VAX platforms are: Data Processing Design, Inc.'s Gold-Fax and Omtool, Ltd.'s FAX Sr. VIP. Pricing for these products starts at \$995. For product information, call Data Processing Design at (800) 843-1317 (outside California call (714) 974-1515) and Omtool at (800) 886-7845.

What is the source of the Asynchronous Transfer Mode (ATM) specification? Where can I get a copy of it?

David Holigan, Lawrence, Mass.

Victoria Marney-Petix, author of Your Pocket SONET/ATM Glossary and chief consultant of Marpet Technical Services, an internetworking and network management consulting firm, responds:

Two ATM standards — User Network Interface (UNI) and Network to Network Interface (NNI) — were developed by the ATM Forum in Mountain View, Calif. You can get copies of the specs by calling the ATM Forum at (415) 962-2585 or fax them your request at (415) 941-0849.

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Letters

Continued from page 43

Hey, that's life, nothing is as constant as change. Stay tuned for even bigger ATM events. We ain't seen nuthin' yet!

P.S. Keep up the superior job, and I suggest that you originate a help column for ATM investors.

*Dave Rogers
Independent consultant
Pittsburgh*

Acro-batty

I avoid products that do not follow industry standards. *Network World* is one such product. Networking magazines, in general, do not break apart acronyms, especially acronyms where the words themselves have no meaning. More people can recognize TCP/IP and NET-BIOS than can recognize the words Transmission Control Protocol/Internet Protocol or Network Basic Input/Output System.

I find this annoying, but don't take my word for it. Simply look at the rest of the networking magazines in the world.

*Robert Graham
Custom programming engineer
ProTools, Inc.
Beaverton, Ore.*

Forgotten promise

I enjoyed Bryan Toney's Viewpoint thoughts (Aug. 16, page 35). It struck an old cord when he talks about, "Instead of trying to develop one large application...client/server allows smaller applications..." The point is valid, but the emphasis should be elsewhere.

Doesn't anyone remember the promise of what we used to look forward to as the coming of "cooperative processing?" It never came (neither did IBM's Systems Application Architecture, for that matter), and everyone seems to have forgotten.

The point of cooperative processing was twofold. First, part of the application would run on the desktop. This involved graphical user interface (GUI) front ends for the user and running processing MIPS where they were cheapest. The data needed for this processing could be stored locally (on the desktop or in the work group environment).

Second, other parts of the application would run elsewhere. Those MIPS could be centrally located on a server (an IBM 3090, Application System/400 or whatever), and the user wouldn't know or care. The program on the desktop talks to the program on the server transparently. (Remember LU 6.2, Advanced Program-to-Program Communications in the IBM world?) Also, data stored anywhere in the network could be accessed by these programs transparently.

What happened to cooperative processing?
*Mike Drummer
Senior technology consultant
Perle Systems, Inc.
Westmont, Ill.*

Don't count out PBXs

In reference to the opinion column "LANs, not PBXs, will anchor user ATM implementations" (Aug. 2, page 32):

I think we're going to see the real-time applications necessary for voice so far exceed the current capabilities of local-area networks in their ability to maintain uptime so that any future ATM directions for real-time applications — particularly voice — must, by default, sit on the private branch exchange side.

I've worked both worlds, having spent a number of years in data and the last 3 1/2 years in telecommunications, and, to my surprise, the telecommunications environment is much more sophisticated from an uptime user interaction direction.

Users require far more from a telecommunications system than any data system I've ever had to work with. And users are far less critical of data systems than they are of voice systems.

There's so much at this point that data systems (LANs) must overcome to become even adequate voice messaging media that I think it's extremely premature to lead users to believe that the voice application, particularly through ATM on LANs, is the direction we're going.

Even AT&T Bell Laboratories is hesitant to say things like that. It's not even making any predictions at this point as to whether the data or voice side will lead ATM.

*Danny Gmeiner
Director of telecommunications
The Claremont Colleges
Claremont, Calif.*

Storage space

Your recent article on hierarchical storage management (HSM) (Aug. 2, page 19) is correct about HSM fast becoming a local-area network issue. However, the new products used to illustrate this trend are not HSM products and give your readers wrong information about this important new technology.

True HSM systems, as they have operated on mainframe computers for more than 15 years, are two-way systems that maintain all files on-line to users, automatically migrating and recalling files.

The products you listed in your article — Palindrome Corp.'s Network Archivist and Advanced Software Concepts' NetArchive products — only archive and migrate files one way off the hard drive and are, therefore, not HSM systems.

There is a critical difference between HSM and archiving. HSM systems extend on-line storage capacities well beyond the size of the hard drive, monitor disk storage levels, migrate files and automatically maintain on-line access to all files.

Archiving systems, however automated, require administrators to manually load tapes and restore files to users.

As the first vendor to deliver a true HSM system for Novell, Inc. NetWare, we are especially concerned that we educate the market accurately about HSM.

We would be happy to discuss this definition and provide whatever third-party technical verification that you require regarding the correct definition of HSM.

*George Rea
Executive vice president
Conner Peripherals
Lake Mary, Fla.*

Editor's response: We seem to be in agreement that HSM will, over the next few years, become more important to LAN administrators and users. However, as this is such a new technology to the LAN world, it would be logical that there are discrepancies over definitions of what a "true" LAN-based HSM system can and cannot do.

Since it is such a new topic, we welcome input from those companies involved in the LAN-based market as a way of educating readers on the differences between HSM and existing technologies.

This will no doubt help better prepare users for storage decisions they will have to make in the not-too-distant future.

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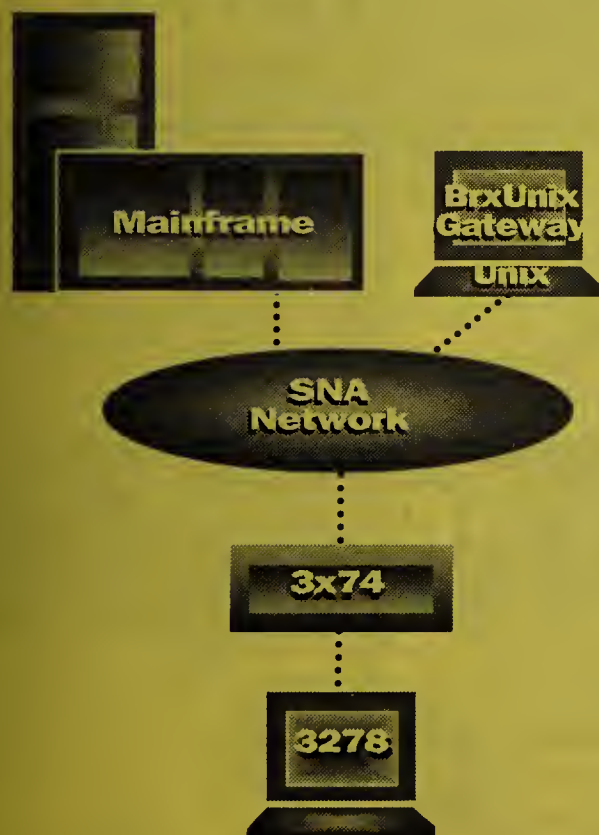
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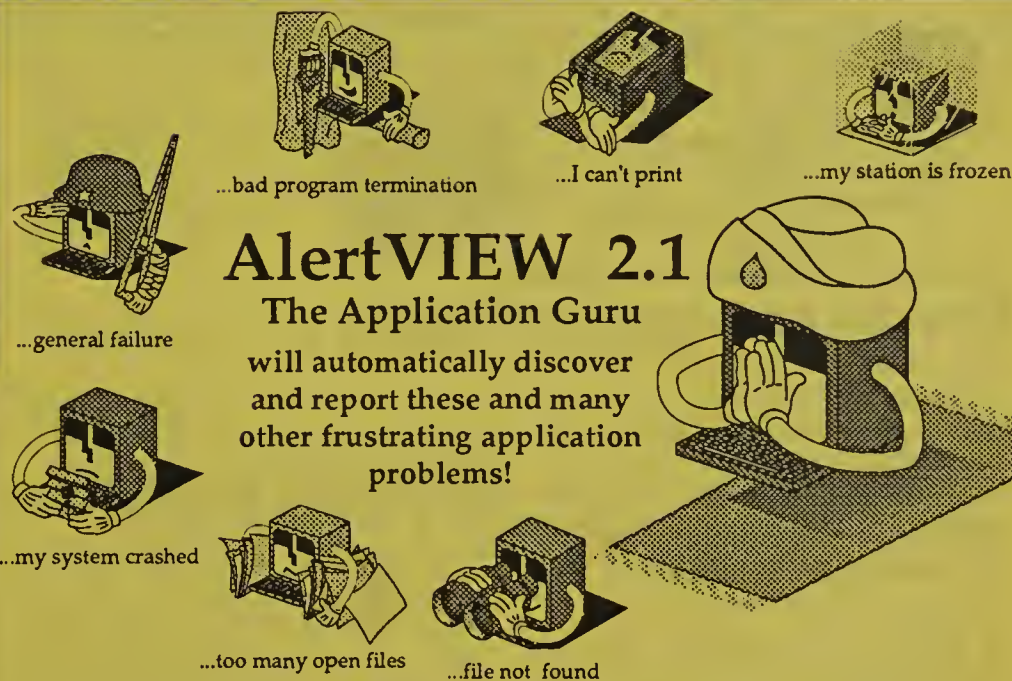
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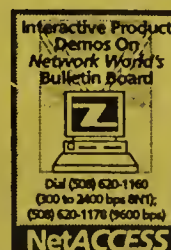
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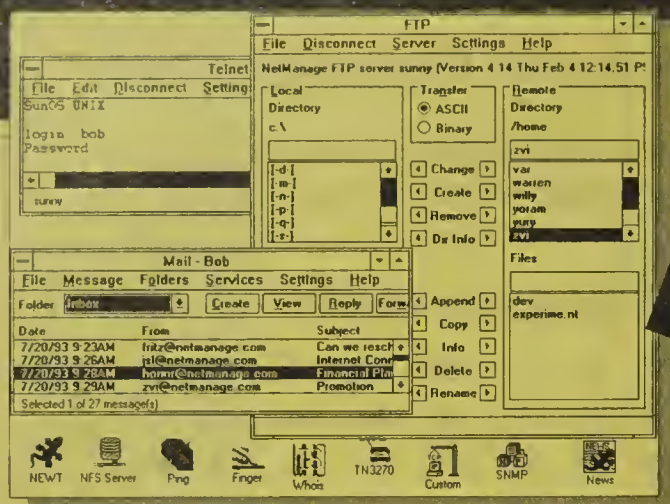
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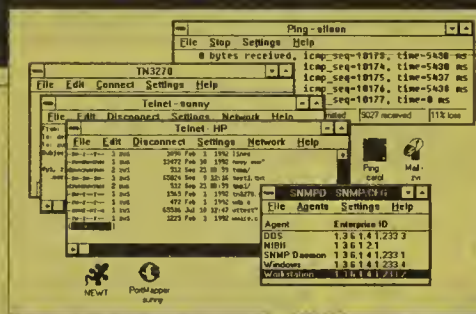
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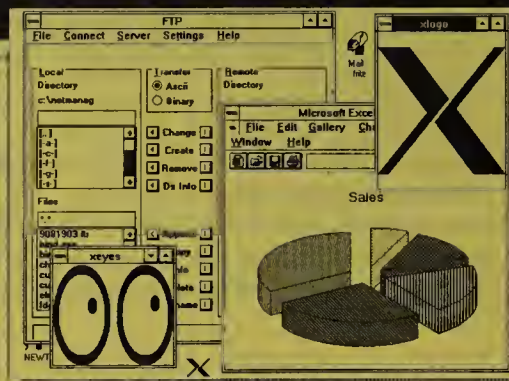
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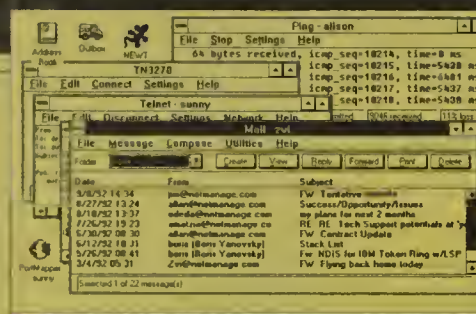
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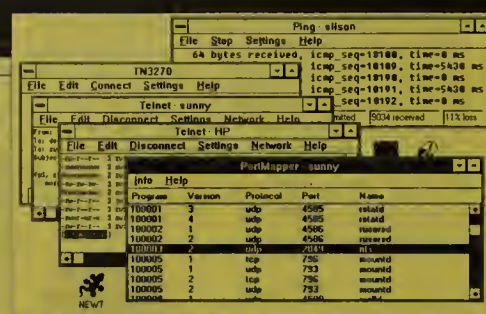
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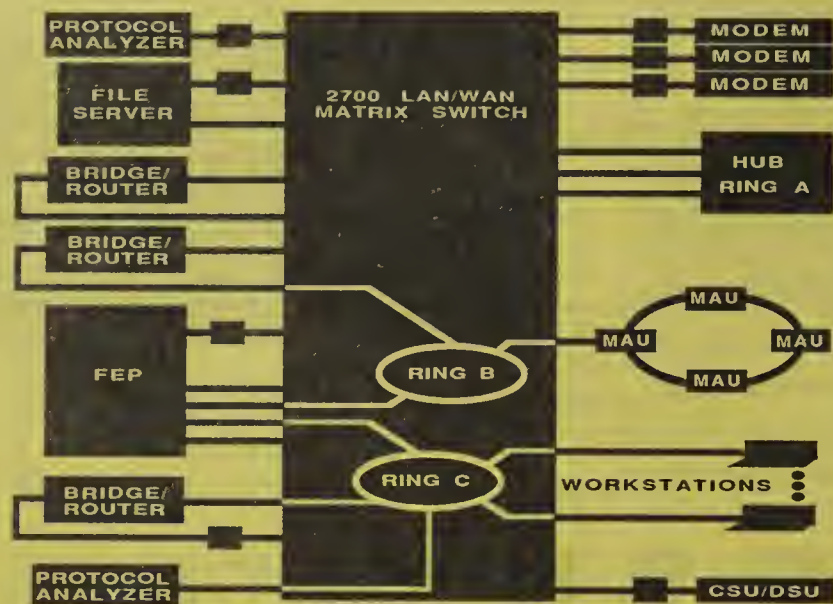
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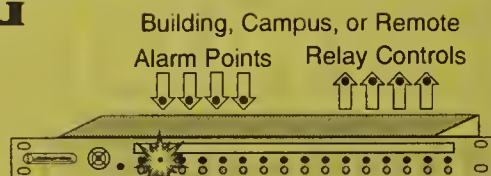
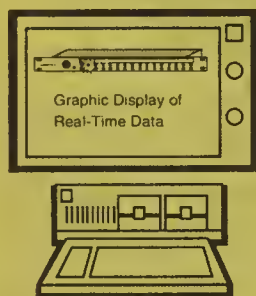
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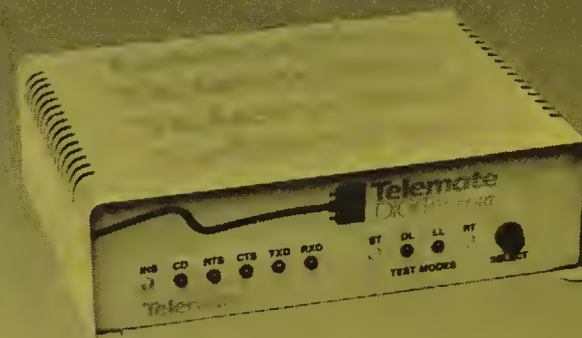
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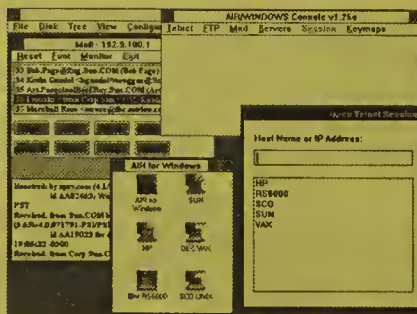
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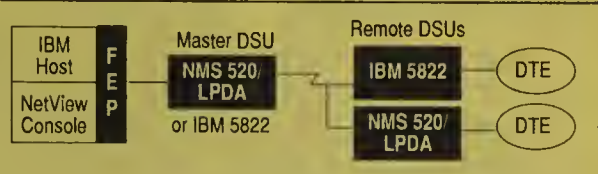
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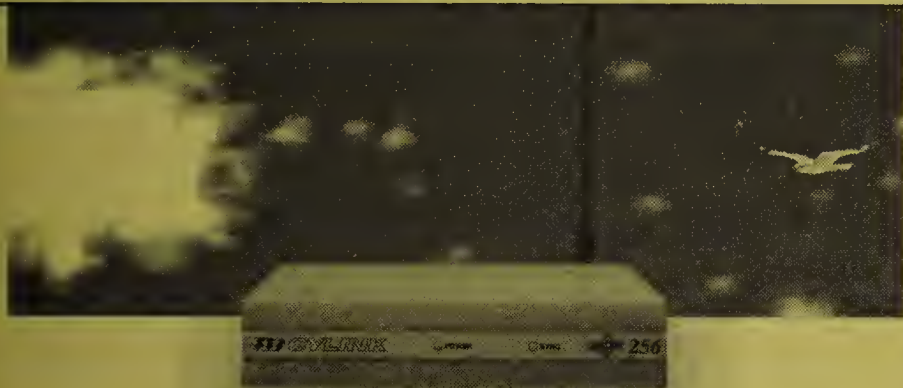
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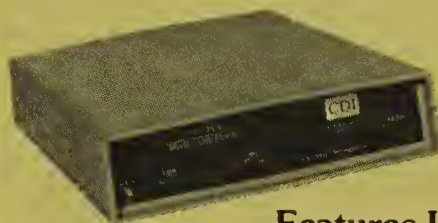
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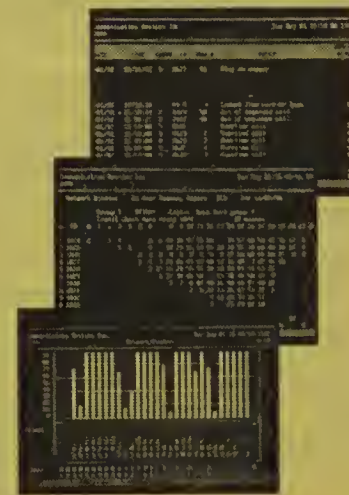
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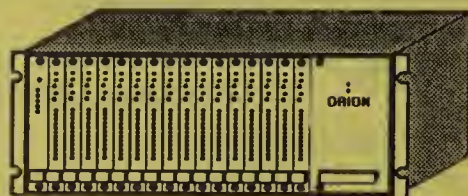
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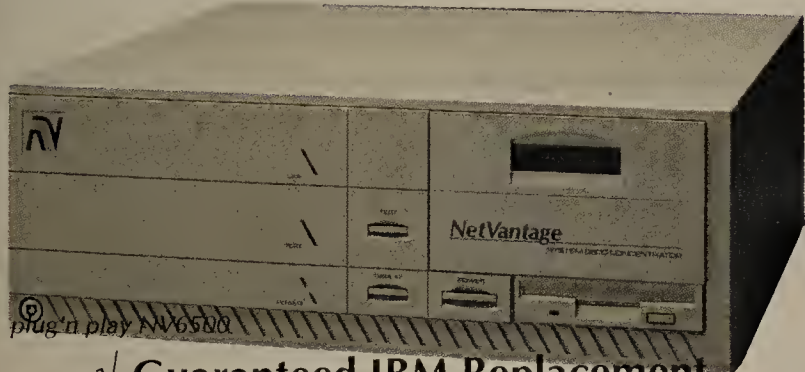
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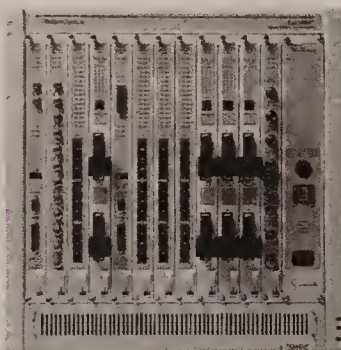
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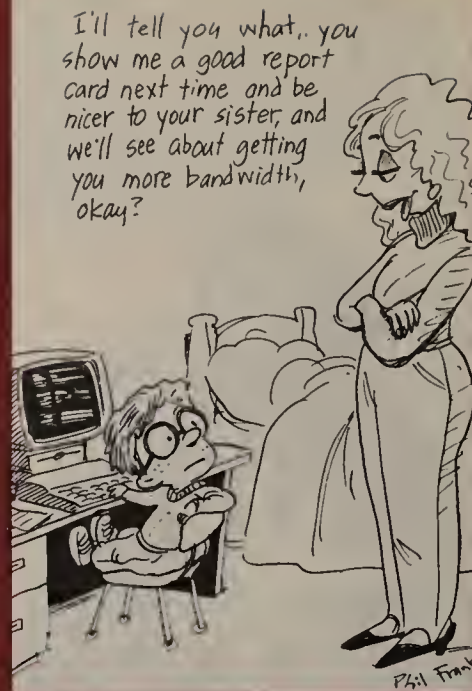


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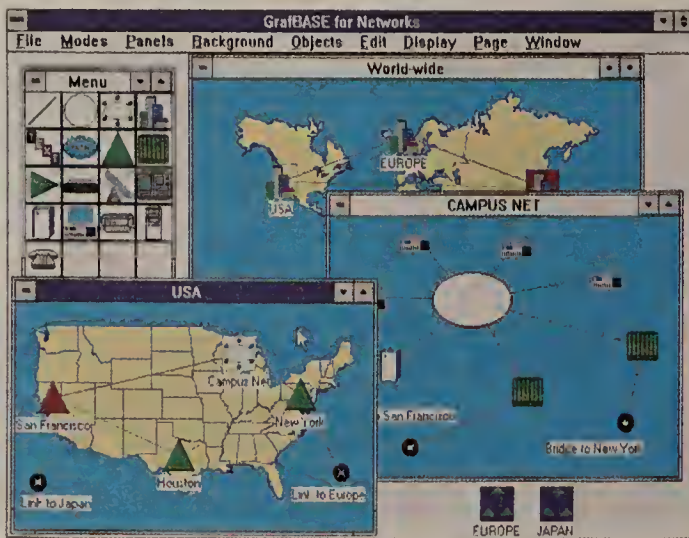
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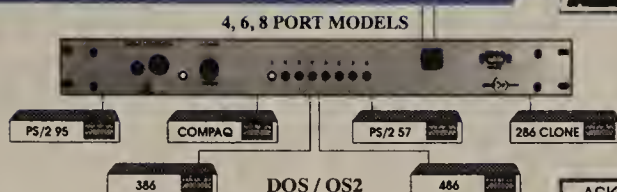
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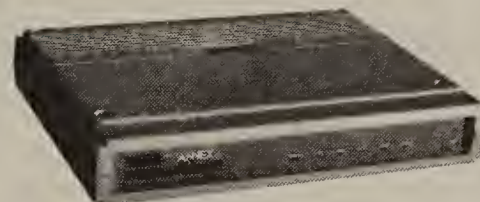
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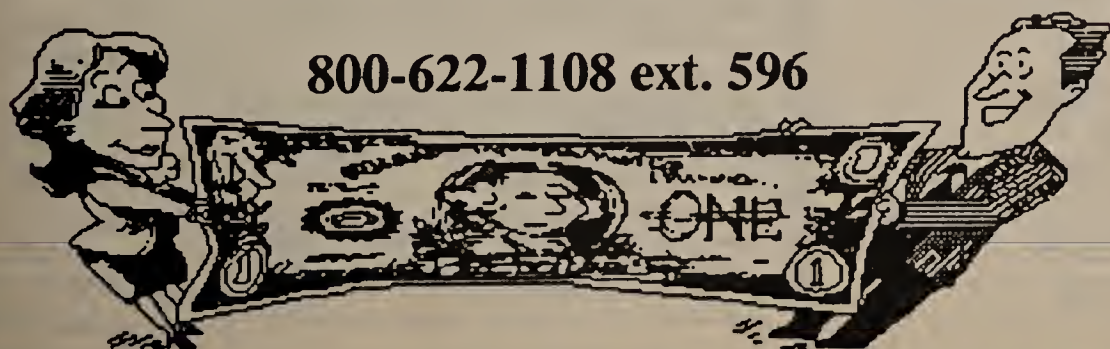
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IBM adds new enterprise net mgmt. applications

Tools to fall under SystemView architecture.

BY MICHAEL COONEY

Raleigh, N.C.

IBM last week rolled out a series of products designed to help users more easily manage multivendor enterprise nets, including a more dynamic version of NetView, with new features for controlling LANs and APPN networks.

Along with NetView Version 2 Release 4, IBM introduced a variety of other management tools that had been expected, such as AIX SNA Manager/6000 for managing Systems Network Architecture nets from the NetView/6000 platform (NW, May 17, page 1).

Other applications include the NetView MultiSystem Manager, which provides more control over local-area network from the host-based NetView, and an enhanced LAN NetView Management Utilities, an OS/2-based product designed to feed LAN management information to OS/2 LAN Server and NetView/6000 (NW, June 28, page 1).

All of the products fall under the SystemView architecture, IBM's systems and network management blueprint that encompasses a host of products for managing enterprise networks.

"These products will help users manage anything from anywhere in the enterprise," said Bill Warner, Networking Systems director of IBM enterprise management.

Added Anura Guruge, an independent analyst based in New Ipswich, N.H., "Anytime NetView gets improved LAN management capabilities, it's good for users."

The NetView enhancements are primarily designed to improve the high-end manager's ability to control LANs and evolving Advanced Peer-to-Peer Networking (APPN) nets. NetView 2.4 also includes new customizable automation features, such as dynamic definition of downstream users. With this feature, NetView operators no longer have to define every user or device on the net because NetView will automatically detect changes and reflect them in its topology database.

It also dynamically reflects changes, such as shutdown or removed devices, on the NetView Graphics Monitor Facility (GMF), which is NetView's object-oriented graphical monitor. In the past, GMF's net view was static, unless the user redefined it.

One of NetView 2.4's biggest improvements, however, is the ability to dynamically discover and build an object-oriented topology map of APPN nets, store it in NetView's Resource Object Data Manager (RODM) and display it on the GMF. RODM is Net-

View's object-oriented network management database.

"Users do not have to define the APPN net," Warner said. "RODM will use a [Common Management Information Protocol] session to transfer APPN management data back and forth."

IBM demonstrated the CMIP/RODM connection at its last APPN Implementors' Workshop (NW, April 19, page 2).

Also utilizing the RODM database is another new application, NetView MultiSystem Manager/MVS. This application lets NetView centrally control any LAN managed locally by IBM LAN Network Manager, as well as gather management data from Novell, Inc. NetWare LANs.

MultiSystem Manager automatically gathers topology and status information from the LAN Network Manager or NetWare, stores it in RODM and displays it on the GMF. "This will give NetView true control over NetWare

LANs for the first time, and these are the first applications that will really take advantage of RODM," Warner said.

NetView 2.4 will be available Dec. 17 for between \$937 and \$3,750. The MultiSystem Manager will be available in the second quarter for \$200 to \$761.

AIX SNA Manager/6000 is an application that resides on IBM's

NetView/6000 Transmission Control Protocol/Internet Protocol management platform and gathers SNA topology and device status information from NetView on an SNA host. The SNA data passes over an LU 6.2 session to NetView/6000 and is displayed on a single integrated screen.

According to Guruge, SNA Manager/6000 is another step in IBM's quest to make the NetView/6000 an enterprise manager. "But NetView is still in the picture with this application, so the umbilical cord hasn't been cut yet," he added.

SNA Manager/6000 will be available in the second quarter of 1994 for between \$15,000 and \$75,000.

IBM also announced a revamped LAN NetView Management Utilities (LMU). LMU is an element management product that runs on OS/2, DOS or NetWare machines IBM has enhanced with a Simple Network Management Protocol agent that lets it feed net management data to NetView/6000. It reports performance and systems management information to a local manager, such as LAN Network Manager.

LMU will be available Nov. 26 for \$995.

©IBM: (800) 435-4199.



WARNER

WALTER CALAHAN

NW unveils technology winners

Network World readers have chosen the winners of the second annual Enterprise Technology Awards (ETA), which honor vendors whose products and services have passed the toughest test — actual use in enterprise networks.

Through the balloting process, NW readers identified the suppliers whose products are most interoperable or best designed to work in an enterprise network. The awards were presented recently at a ceremony during the INTEROP 93 August show in San Francisco.

"Our 150,000 readers operate the toughest testing lab in the world — their actual enterprise networks. The winners have proved themselves where it counts most, in the real world," said NW Editor John Gallant.

1993 ETA winners are as follows:

■ LAN equipment: Ethernet adapters, **3Com Corp.**; FDDI adapters, **Cabletron Systems, Inc.**; token-ring adapters, **IBM**; bridges, **Cabletron**; routers, **Cisco Systems, Inc.**; intelligent hubs, **SynOptics Communications, Inc.**; LAN diagnostic/management tools, **Novell, Inc.**; LAN servers and LAN

superservers, **Compaq Computer Corp.**; network operating systems, **Novell**; peer-to-peer networks, **Novell**; wireless LANs, **Motorola, Inc.**; Apple connectivity products, **Apple Computer, Inc.**

■ Software: Client/server application development tools, **Oracle Corp.**; communications software, **Datastorm Technologies, Inc.**; DBMS, **Borland International, Inc.**; E-mail software, **Lotus Development Corp.**; E-Mail switches, **Novell**; middleware, **IBM**; group collaboration software, **Microsoft Corp.**

■ WAN equipment: DSU/CSUs, **AT&T Paradyne**; high-speed modems, **Hayes Microcomputer Products, Inc.**; imaging systems, **IBM**; integrated network management systems, **Hewlett-Packard Co.**; muxes and packet switches, **Motorola Codex**; PBXs, video conferencing systems and voice mail, **AT&T**.

AT&T captured the ETAs in all wide-area network service categories, including 800, digital private lines, Integrated Services Digital Network services, switched digital services, value-added network services and virtual network services.



Ingres to announce tools strategy

BY PETER LISKER

San Francisco

The ASK Group, Inc. is expected Oct. 4 to detail plans for a series of upgrades to the development tools for its Ingres database, as well as new tools that will help users develop client/server applications for diverse database environments.

The tools for the Ingres relational database will provide for the first time a link to databases from Oracle Corp. and Sybase, Inc. Existing Ingres tools only support development of applications on Ingres systems, a shortcoming that seriously reduced the flexibility and usefulness of the tools for users in multivendor shops.

Ingres' move comes on the heels of announcements by other vendors, such as Informix Software, Inc., Oracle and Sybase, that plan to open their development tools to other data sources.

ASK will introduce custom drivers that allow users of the new tools to develop open applications via support for Microsoft Corp.'s Open Database Connectivity (ODBC) application Program interface (API). The new tools will include a graphical report writer and a graphical interface code generator.

Also, new versions of Ingres Windows/4GL, a graphical development environment, and Ingres/Vision, a character-based application development tool, will be introduced. The availability of a complete set of tools oriented to the graphical user environment has been a consistent demand from customers.

"We've always liked the Ingres database and Windows/4GL but have felt ASK needed to offer a more complete set of tools that provided us with interoperability," said an applications manager at a government agency who had been briefed on the upcoming announcement. "Traditionally, the lack of connectivity between the Ingres tools and Oracle has been a major stumbling block for us."

An Ingres spokesman confirmed plans to introduce new products and provide the custom drivers needed to connect to Oracle and Sybase databases but

declined to discuss pricing or availability except to say, "We'll have our tools out far in advance of anything Sybase will be able to offer."

Sybase this month will ship Version 2.0 of its Gain-Momentum development software, which works with Sybase and Oracle databases. The company's model-based Enterprise Momentum development tools will be released late next year.

Defining a consistent tool strategy has been a primary mission for Steve Weyl, president of ASK's Tools Products Unit, ever since that unit was split off from the database group last March.

"I think the Ingres tools are very impressive and will surprise people within the database community," said an analyst who was also briefed. "They've really taken their customers' messages and needs to heart, and the tools show how serious they are about being a major player in the client/server tools arena."

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Pinpoint

Continued from page 8

company plans to license, will cost only \$300 each. This is far less than the price for today's RAM or ARDIS packet radio modems, or the new IBM Cellular Digital Packet Data modems coming in January.

However, the company faces a number of obstacles. For users to access the new service, Pinpoint will need to conclude licensing agreements with modem manufacturers and add more software developers like Visual Data Systems and Roadshow International to its list.

And while Pinpoint says it has both the required Federal Communications Commission license and the infrastructure capital to move ahead with service in Dallas in early 1995, only substantial investor commitment will give it the means to reach its goal of a nationwide network.

"There is a need for location-specific services," Ira Brodsky, president of consultancy Datacomm Research in Wilmington, Ill. "But some of the most enticing applications will require nationwide coverage."

Brodsky added that if PinPoint were more flexible in allocating bandwidth to users — perhaps giving a user 5% at one time — it could heighten the service's appeal. □

Wang lives: will focus on net app software

BY BOB BROWN

Lowell, Mass.

Wang Laboratories, Inc. this week is expected to emerge from Chapter 11 bankruptcy protection with a new look and a set of new imaging products and related network application software.

Under the reorganization plan Wang filed with the U.S. Bankruptcy Court in August, the company outlined how it has begun to make the transition from a provider of proprietary hardware and software to a vendor of applications designed to run on open client/server computing platforms.

The new Wang

Where Wang was at its peak in the mid-1980s and where the company expects to be during the 12-month period beginning Oct. 1.

	Before	After
Employees	31,000	6,000
Revenue	\$3 billion	\$955 million (estimated)
Primary business	Proprietary minicomputers, word processing software	Systems integration, client/server application development tools and imaging, work flow, document management and E-mail software

SOURCE: WANG LABORATORIES, INC., LOWELL, MASS. GRAPHIC BY TERRI MITCHELL

Wang next week plans to announce at Imaging Expo '93 enhancements to its Open/image products and demonstrate the company's first work flow system, which will be formally announced and available early next year. It will also demonstrate a new document management offering, dubbed Open/profound, that will be announced next month.

Wang intends to make some noise in the electronic mail market with its Open/office product and in the client/server application development market with its Professional Application for Creative Environment tools, said Neil Exter, director of office software. These offerings will go beyond Wang's existing VS-based E-

mail and application development software to support other vendors' platforms, he said.

"We'll be delivering a set of software products that run on open systems in client/server environments where the customer is looking to bring more power to the work group," Exter said.

Today, software accounts for only about 15% of the company's overall revenue, but this part of the company's business is expected to grow by as much as 30% a year, he said.

Wang's strongest position is in imaging, where the company is already considered a leader even though its Wang Integrated Imaging System (WIIS) is proprietary. The company's new Open/image software, which works with WIIS, runs as a NetWare Loadable Module on Novell, Inc. servers and on Unix systems from Hewlett-Packard Co. and IBM.

The company will add support for Sun Microsystems, Inc.'s Solaris and the HP 3000 MPE/iX platforms at Imaging Expo this week, said Kerry Bensman, director of imaging products.

According to Bensman, the growing use of imaging applications will lead to an increased need for work flow and document management systems as well, which is why Wang is building complementary products in those areas.

"To be successful in any of these areas, we think companies will need to be good in all three," Bensman said. "One of the main reasons our creditors liked our reorganization plan is our strategy for offering an integrated set of imaging, work flow and document management products that meet a market need. They felt this was a case where there will be market pull for these products."

Wang's Open/work flow will consist of client and server pieces. The Windows-based client software will provide users with a graphical work flow application builder. The server-based work flow engine will handle routing and work flow logic. The server software, which initially will run on Unix systems from IBM and HP, includes a Wang object database.

The document management system, Open/profound, will enable users to store and retrieve documents in an electronic library of spreadsheets, word processing documents and others. The document management system, which will feature an object database at the server, will be able to store documents that include images as well. This product will be available by November and run on Unix platforms from HP and IBM, as well as on NetWare servers. ■

Far-reaching E-mail debuts

BY BOB BROWN

San Jose, Calif.

Novell, Inc. last week announced a new version of its remote electronic mail product designed to let laptop users exchange E-mail whether they are in the office or on the road.

NetWare Remote Message Handling Service (MHS) 2.0 provides portable DOS, OS/2 and Windows personal computer end users with access to all NetWare messaging services, including E-mail, facsimile services and others.

The software complements Novell's NetWare Global MHS multiprotocol E-mail system and works with E-mail products from other vendors, such as Beyond, Inc. and Da Vinci Systems Corp.

The most significant enhancement to NetWare Remote MHS 2.0 is a feature called Part-time Remote User Mode, said Mark Ryan, a senior product manager at Novell. This feature, which works only at sites using NetWare Global MHS, addresses the needs of employees who use a laptop for remote computing as well as in a docking station at the office, he said.

The software automatically recognizes whether the user is in the office or on the road. If in the office, the software lets the user exchange E-mail over the company's existing network using a LAN adapter

card. If the user is on the road, it supports communications over phone lines.

Novell's previous remote offering, NetWare Remote MHS 1.5P, only addressed the needs of remote users and did not allow the user to tie directly to the network via a LAN adapter card.

The new software makes life easier for network administrators by making remote mail users appear as local users, Ryan said. This enables an administrator to establish one set of rules that applies to both remote and office-based users, and makes updating address directories easier, he added.

Jim Braun, software development manager for Kansas State University in Manhattan, said the Part-time Remote User Mode feature is useful. The university participates in a program in which specialists on different subjects exchange E-mail from both the office and the field, he said.

Novell has also designed NetWare Remote MHS 2.0 so that it can be embedded into front-end E-mail packages from Beyond, Da Vinci and others, which enables users to load both an E-mail front end and communications package in one step.

NetWare Remote MHS 2.0 will be available by October and will cost \$100.

©Novell: (800) 638-9273.

AT&T to announce new wireless switch at TCA

BY BOB WALLACE

San Diego

AT&T is expected to use the Telecommunications Association, Inc. (TCA) conference here this week to announce a wireless adjunct system that lets existing AT&T PBXs support wireless telephones.

The products, both part of AT&T's new TransTalk family, operate in an unlicensed frequency range designated for public use by the Federal Communications Commission.

The adjunct system will attach via an analog link to AT&T private branch exchanges ranging from the low-end Merlin Legend to AT&T's flagship Definity Generic 3 high-end digital PBX.

Sources said the system will comprise a main control unit, modem-sized radio transmitter/receivers that are placed throughout a building, and lightweight telephones that support a handful of basic features.

TransTalk 9000 uses frequencies in the 902- to 928-MHz range and employs spread-spectrum technology, whereby transmissions are distributed over a wide frequency band, then gathered into their original form at the point of reception.

The technology is less susceptible to interference than wireless schemes

that use a narrow 15- to 20-kHz frequency.

"This is just the beginning of a series of announcements of wireless products from AT&T," said Peter Bernstein senior vice president of research for Probe Research, Inc., a Morristown, N.J., consulting and research firm.

"We can expect AT&T to move aggressively to expand its beachhead in the wireless PBX market," Bernstein said.

"This enables users to extend the reach of their PBXs," said Alan Sulkin, president of TEQConsult Group, a Hackensack, N.J., research and consulting firm that tracks PBX development.

"There are organizations like hospitals where many employees are mobile and don't want to be running back and forth to their phones to make and answer calls," Sulkin said.

TransTalk 9000 can support 40 simultaneous conversations.

Sources said the TransTalk 9000 will be available in the first quarter of 1994, and the system will cost under \$1,000 per station.

AT&T is not the first to announce a wireless PBX adjunct. SpectraLink Corp., a Boulder, Colo.-based firm, announced its SpectraLink 2000 Pocket Communications System in June 1991. ■

Hiring

Continued from page 1

cal platforms and various network topologies, including Ethernet. The TSE must have three years of practical field work in the data communications industry and be a Novell, Inc. Certified NetWare Engineer or have equivalent training.

■ The Journeyman Systems Engineer must demonstrate advanced knowledge of Unix and network management issues and must have completed five years of practical field work.

■ The Master Systems Engineer must demonstrate knowledge of Transmission Control Protocol/Internet Protocol, Simple Network Management Protocol, bridges and routers, Fiber Distributed Data Interface, Asynchronous Transfer Mode and cross-platform operating system technologies. Also, they must have completed at least five years of practical field work.

■ The Senior Systems Master Engineer must be familiar with microwave and satellite technologies, as well as bridges and routers, and be able to perform advanced protocol analysis. The person must have 10 years of practical field work experience.

NACSE is devising tests for each of the categories and negotiating with

third-party testing centers around the country to administer the tests. Those who pass an NACSE test will be authorized to use the NACSE logo on their business card or letterhead.

Some people in the network industry questioned the value of NACSE and whether employers and network engineers really want or need a certification program.

"I've never sensed a ground swell of interest from either employers or network professionals for a certification program," said Frank Schoff, a recruiter in Cedar Mountain, N.C., who specializes in placing network and telecommunications professionals.

Schoff added that networking technology is so broad and changes so rapidly that it would be difficult to keep the program up-to-date and maintain the credibility of the certification status.

However, Kile said NACSE is setting up a standards committee that will continually review the state of networking technology and revise certification criteria accordingly. To aid employers, NACSE will also offer an on-line database that provides details of each member and that person's certification level.

NACSE membership dues, which are \$150 per year, will be devoted to marketing the group to employers and network engineers, Kile said.

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Health care

Continued from page 1

widely debated, the idea that the national health care system should leverage network technology is well accepted. Yet questions linger about how ready health care companies are to get on-line with one another.

"It's a large step," said Robert Beckley, director of information systems at Brigham & Women's Hospital in Boston. "We think of ourselves as fairly advanced, but we would need to make major changes at considerable cost. If the government mandates it and doesn't fund it, I don't see a lot of chance for success."

Bob Reinhold, a senior manager at consultancy Ernst & Young's Technology Services Practice in Fairfax, Va., said the hospitals on his client list have made progress in tying together general ledger, test ordering and other systems within their own shops. He added that health care organizations are trying hard to cut costs through network technology. For example, some hospitals are setting up centers where X-rays taken at different locations can be sent to a central pool of radiology technicians.

But hospitals have had little incentive to integrate their systems with other health care providers or insurance carriers.

That, he said, will be a big challenge because of the diversity of systems used today.

Some help may be on the way for health care organizations looking to share information. At the National Institute of Standards and

Technology last week, where a meeting of 12 technical groups in the Open Systems Environment Implementors' Workshop was held, one group vowed to play a big role in defining data standards for the medical industry.

The Health Care Special Interest Group, chaired by Jack Harrington, systems architect at Hewlett-Packard Co., has been tapped to make recommendations on technology profiles for what the Clinton administration calls the National Health Information Infrastructure. The group will look at EDI and standards for image, audio and networking that might be used in the creation and transmission of an Electronic Patient Record, he said.

The creation of the Electronic Patient Record "has to be done with the concern and safeguards for security and confidentiality," Harrington said.

Meanwhile, the government is ready to toss some of the nearly \$500 million under the Department of Defense's Technology Reinvestment Program into a project that would test how a fully automated health care system would work. The Health Care Industry Consortium, a group of more than 30 information systems and health care industry firms, submitted one of 3,000 proposals to oversee such a project.

The consortium's proposal calls for testing whether a software requirements architecture for the Department of Defense would be applicable to the health care industry, said a spokesman for Austin, Texas-based Microelectronics and Computer

Technology Corp. (MCC), which is managing the group.

The architecture would outline the software products, such as EDI software, that would be needed for organizations to build information systems that will interoperate internally and externally, he said. Further details were not available about this proposal, which could be accepted as soon as October.

EDI, which typically would be used in the health care industry to support communications between health care providers and insurance carriers or the government, has been among the most active technology areas for members of the health care industry for years.

Last year, the Workgroup for Electronic Data Interchange (WEDI), a forum for hospitals and insurance firms convened by then-Secretary of Health & Human Services Louis Sullivan, released a report endorsing use of standardized ANSI X12 EDI transaction sets in processing claims.

The WEDI report also called for investigation into use of machine-readable "smart cards" with patient information. But the report cited as obstacles the lack of standardized EDI forms for the health care industry and apathy among its members.

Still, EDI usage has become popular in many quarters. Nearly three-quarters of Blue Cross/Blue Shield Association's 59 independent state insurers, which process claims for 100 million people in the U.S., use EDI. More than 60% of the insurance forms submitted by hospitals or physicians to these Blue Cross affiliates arrive via EDI.

Another EDI effort in the health care industry is Healthcare EDI Corp., a Little Rock, Ark., organization that its

Matching applications and technology in health care

Applications	Technologies						
	Communication networks	External links	Electronic messaging	Image processing	On-line processing	Batch processing	Expert systems
Enrollment	X				X	X	
Eligibility	X		X		X	X	X
Authorization	X		X		X	X	X
Claim submission	X			X	X	X	
Coordination of benefits	X		X			X	X
Appointments/admissions	X		X		X		X
Laboratory tests	X		X		X		X
Prescriptions	X		X				X
Supplies	X	X	X		X	X	
Patient records	X		X	X		X	X
Laboratory results	X		X	X		X	X

SOURCE: WORKGROUP FOR ELECTRONIC DATA INTERCHANGE, WASHINGTON, D.C.
GRAPHIC BY SUSAN J. CHAMPERY



First lady Hillary Rodham Clinton was instrumental in assembling the Clinton administration's health care reform plan.

AP WIDE WORLD PHOTOS

Controllers

Continued from page 1

This week, IBM will announce a new, 486-based Token Ring Interface Coupler (TIC) with twice the capacity of the current version. The new TIC will support two token-ring LANs, supporting a total of 2,000 devices, which is up from the 1,000 devices supported by the existing single-port TIC.

IBM also will roll out a new Enterprise System Connection (ESCON) fiber-optic mainframe channel adapter that improves throughput by 1 1/2 times as compared to the existing adapter, Lorrain said. A new version of NCP will be unveiled that supports the new TIC and ESCON adapter.

Within the next year, IBM will add support for frame relay data terminal equipment and data control equipment (DTE/DCE) interfaces to the 3746 expansion chassis.

The 3745 already supports frame relay in both DTE and DCE mode, but off-loading frame relay processing to the 3746 will result in a threefold throughput improvement, Lorrain said.

IBM will also give the 3745 support for the Routing Information Protocol (RIP), which will enable it to function as an IP router. Today, all Transmission Control Protocol/Internet Protocol devices and routes have to be statically defined to the NCP/VATM complex.

"The 3745 will be able to pick off TCP/IP traffic and route it along to its destination without all of the overhead of the past," Lorrain said.

According to Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C., "Supporting TCP/IP will be one of the ways IBM keeps the 3745 in the multiprotocol networking game and keeps it from atrophying."

The 3745 improvements are designed to breathe new life into a box many industry observers say is on its way out. Routers and devices such as IBM's own 3172 Interconnect Controller can, in many cases, obviate the need for the 3745. The 3172 is IBM's channel-attached LAN-to-mainframe gateway.

"Those who say the 3745 is dead are not facing reality," Granatino said. "We expect our future announcements to show the 3745 is alive and well and helping users reduce their operational costs."

According to Bill Conklin, director of networking subsystems in IBM's Networking Systems group, if users have lots of SNA/SDLC traffic and multiple hosts, the 3745 would be the box of choice.

"The 3172 will never touch the 3745 in terms of SNA/SDLC handling capabilities, but it can replace the 3745 in certain SNA networks that have a lot of LAN traffic," Conklin said.

Future enhancements to the 3172 prom-



MILLS

ise to make the box more powerful and strategic than it is today.

In the next year or so, IBM intends to increase the power of the platform by building a model based on Intel Corp.'s Pentium processor. Today's largest 3172, the Model 3, uses a 486 processor.

Other 3172 enhancements could include support for the SNA Server function in Microsoft

Corp.'s Windows NT environment, giving Windows NT users on a LAN access to IBM SNA resources on the mainframe.

The 3172 is also the only IBM controller that will support an ATM interface in the future, Lorrain said.

"The 3172 is the most schizophrenic box IBM sells — it can be basically whatever IBM wants it to be based on what software they stick in it," said Dave Passmore, vice president and service director for Gartner Group, Inc., a consultancy in Stamford, Conn. "The 3172 is highly flexible and IBM will continue to offer new and better applications on top of it."

The 3174 Establishment Controller will also receive a few strategic upgrades in 1994, the most important of which is support for higher speed communications links.

A future release of the box's Configuration Support Release Cooperating system will support line speeds of up to 256K bit/sec when used in a frame relay net. Currently, the 3174 can support 64K bit/sec SDLC links, although IBM has previously indicated its intention to add frame relay support. □



GRANATINO

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NETWORK WORLD

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SynOptics, we're calling you out.

The Great Hub Shoot Out

History will record that on October 5, 1993 at NetWorld Dallas, the good guy in the white hat won. And that gunslinger SynOptics was left in the dust.

When you compare NetWorth's Series 4000 hub to SynOptics' Series 3000 hub, there's no contest. Based on manageable bandwidth-per-port, price/performance, and compatibility with NetWare™, NetWorth wins every time.

Our Secret Weapon

What gives Series 4000 such an unfair advantage? NetWorth's new MultiSegment™ technology. MultiSegment engineering allows each Series 4000 24-port module to deliver up to three 10 Mbps Ethernet segments — that's three times more than SynOptics can deliver.

But the big pay-off with segmentation is in price/performance. In similar 144-port configurations, the NetWorth solution is only a fraction of the cost per Megabit of performance compared to SynOptics.

NetWare Load Balancing

When the challenge is played out in a NetWare environment, NetWorth has another ace-in-the-hole. HubView™, NetWorth's Microsoft® Windows-based network management system, creates a seamless way to manage your Series 4000 network. HubView lets you maximize the benefits of segmentation by moving users from one segment to another with just a click of the mouse button. Try that, SynOptics.

Witness History

If you'd like to witness The Great Hub Shoot Out, visit booth #1748 at NetWorld in Dallas. Or if you prefer, send the business reply card or call 1-800-544-5255 for a free guide to better network performance through segmentation.

Oh, and SynOptics — we'll see you in Dodge.

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